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FOREST BIOLOGY RANGER REPORTS 1957

ALBERTA

INTERIM REPORT 1957-2

FOREST BIOLOGY LABORATORY

CALGARY, ALTA

CANADA DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

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MARCH 1958

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FOREST BIOLOGY RANGER REPORTS

ALBERTA

(Forest Insect and Disease Survey No. 30.01-6)

by

J.K. Robins, J. Petty, P.F. LaRue, N.W. Wilkinson
R.R. Stanley, V.B. Patterson, F.J. Emond, J.H. McNeil

INTERIM REPORT 1957-2

FOREST BIOLOGY LABORATORY

CALGARY, ALTA.

(Based on investigations carried out in 1957)

CANADA

DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

FOREST BIOLOGY DIVISION

March, 1958

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FOREST HISTORY REPORTS

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Forest Insect and Disease Survey No. 30-01-5

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R.R. Stanley, V.B. Patterson, F.J. Evans, J.H. McNeil,
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This report was prepared in 1958 and is based on the
investigation carried out in 1957. It is a preliminary
report and is subject to change. It is not intended
for publication. It is for the use of the Forest
History Division, Ontario, Canada.

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INTRODUCTION

The 1957 field season for Forest Biology Rangers in Alberta and the Northwest Territories began about mid-May and ended in the latter part of September. During this period approximately 85,000 miles were travelled by motor vehicle, 800 by boat, 1100 by fixed wing aircraft and 125 miles by helicopter. Forest Biology Rangers submitted 2129 insect and 19 disease samples.

Three new rangers joined the organization early in the season, F. J. Emond and J.H. McNeil to fill newly established positions and N.W. Wilkinson to replace E.J. McNeil who resigned in 1956. District assignments in 1957 were as follows:-

District 1	Crowsnest-Bow River	J. Petty
" 2	Clearwater	P.F. LaRue
" 3	National Parks	N.W. Wilkinson
" 4	Brazeau-Athabasca	R.R. Stanley
" 5	Lac La Biche	V.B. Patterson
" 6	Slave Lake-Grande Prairie	F.J. Emond
" 7	Peace River	E.F. Thornton
" 8	Northwest Territories	J.H. McNeil

Plans to cover districts 6, 7 and 8 as a unit with Ranger Thornton supervising the work of the two new rangers had to be suspended following the serious illness of the former which forced him to leave the field in early June. Rangers McNeil and Emond assumed responsibility for the three districts. Dry weather, favourable to survey work prevailed over the Province during May and June. In July and August, while the southern districts experienced near normal amounts of rainfall, the area north and west of the Athabasca River received almost twice the average amount of precipitation. This hindered survey activities especially in areas served by secondary roads.

Activities in north-eastern Alberta and the Northwest Territories included a survey by boat from Fort McMurray to Hay River, an aerial

reconnaissance by helicopter in Wood Buffalo National Park, an aerial survey of the spruce budworm outbreak in the upper MacKenzie Valley and a survey of timber stands adjacent to the MacKenzie Highway and the new Yellowknife Road.

Major equipment purchased in 1957 included a winch-equipped 1 ton panel truck for the northern districts and a similar vehicle to replace a $\frac{1}{2}$ ton panel truck in the Brazeau-Athabasca District. A propane heating system was installed in the cabin at Entrance. A pre-fabricated cedar log-cabin was erected at Peace River.

Stands of trembling aspen and balsam poplar in central and southern Alberta suffered heavily from outbreaks of a number of species of defoliators in 1957, including Bruce spanworm, the large aspen tortrix and a leaf tier, Compsolechia niveopulvella Cham. In many areas several species were involved and an accurate appraisal of damage by any single species was impossible. In the foothills region between Red Deer and Nanton, clumping of aspen foliage was the cause of considerable concern. This injury was probably caused by the late spring frosts.

Outbreaks of the forest tent caterpillar which occurred in the aspen grove region east of Edmonton may indicate a re-occurrence of conditions prevalent in central Alberta between 1951 and 1953 when severe defoliation of large stands of aspen took place.

An aerial survey of the upper MacKenzie River Valley revealed little change in the status of the spruce budworm outbreak which is known to have existed in that region since 1953. The outbreak of larch sawfly on tamarack in Northern Alberta continued unabated.

A sequential sampling technique for larch sawfly populations developed by W.G.H. Ives and R.M. Prentice of the Winnipeg Laboratory was instituted in 1957, replacing the quantitative sampling methods used in 1955

and 1956. Data from 29 plots was recorded and cocoons were collected for winter rearing.

An extensive sampling programme involving forest tent caterpillar laying sites was carried out near Elk Point in October. The purpose of this project was to obtain data to be used in the development of a suitable sequential sampling technique.

In late September a large stand of Engelmann spruce in a timber berth on the West Castle River was cruised to determine the amount of damage caused by the Engelmann spruce bark beetle.

The forest disease aspects of the survey were limited to the reporting of new infections over $\frac{1}{4}$ section in area involving over 50 per cent of the trees, and to the annual check on known disease outbreaks.

The continued co-operation and help of the Alberta Forest Service, the Provincial Agricultural Extension Service and the Department of Northern Affairs and Natural Resources was greatly appreciated.



FOREST BIOLOGY RANGER REPORT
CROWSNEST - BOW RIVER DISTRICT
ALBERTA 1957

by

J. PETTY

FOREST BIOLOGY LABORATORY

CALGARY, ALTA.

CANADA DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

FOREST BIOLOGY DIVISION

MARCH 1958

INTRODUCTION

Survey work commenced in the Crowsnest - Bow River District on May 10 and was terminated September 9. During this time 2 special surveys were conducted. One of these surveys was to determine what insects were present on alpine larch and was carried out in stands of this species at Highwood Pass and in Banff National Park at Sunshine and Mt. Temple. These places were checked twice during season, the third week of July and the end of August. The other special survey was made the first week in September when the author accompanied R. Stark to the Cypress Hills to check on the distribution and intensity of Hylobius sp. in that area. In the latter part of September and the first part of October, 2 weeks were spent cruising a stand of overmature Engelmann spruce in the timber berth of Alberta Box Works, to ascertain the amount of damage caused by bark beetles. Assistance in this survey was given by Rangers J. Robins, V. Patterson, N. Wilkinson and J. McNeil. Results obtained in the bark beetle survey are given as an appendix at the end of this report.

During the season 357 insect collections and 7 disease samples were submitted. Co-operators sent in 12 insect collections.

Two species of insects came into prominence this year. Larvae of the forest tent caterpillar were found in large numbers in shelterbelts between Lethbridge and Taber and on shade and ornamental trees in the city of Lethbridge. Bruce spanworm caused heavy defoliation of aspen in many areas west of Number 2 Highway. A light infestation of spruce budworm was found at the eastern side of the Cypress Hills. The fall cankerworm was again present in many shelterbelts throughout the agricultural districts of Medicine Hat, Taber and Lethbridge.

Clumping of aspen in the west and southwest portions of the district, and of cottonwood in shelterbelts in this area was very prominent in the spring of 1957.

TABLE 1

Summary of Insect Collections
by Host Trees.

Coniferous Hosts.	No. Coll.	Deciduous Hosts.	No. Coll.
Spruce	59	Manitoba maple	53
Lodgepole pine	47	Trembling aspen	44
Douglas fir	16	Misc. poplar	31
Alpine fir	13	Willow	19
Alpine larch	12	American elm	13
Juniper	<u>3</u>	Ash	7
	150	Birch	<u>6</u>
			173
.....			
Collections from miscellaneous spp.			34
.....			
		GRAND TOTAL	357

INSECT CONDITIONS

Spruce budworm, Choristoneura fumiferana (Clem.).

Spruce budworm was found in most spruce stands this year but there was only one area in which any appreciable defoliation was evident. This was on the east side of the Cypress Hills along Grayburn Creek. Here, in an area approximately $\frac{1}{2}$ mile wide and $1\frac{1}{2}$ miles long, spruce trees showed some discoloration as a result of fringe defoliation. Moth flight occurred this year which could indicate a one year life cycle.

Black-headed budworm, Accleris variana (Fern.).

Larvae or pupae of this budworm were found wherever spruce and fir occurred throughout the district; there were few localities where larvae were numerous, or where damage was noticeable. In the timber limit

of Alberta Box Works near the headwaters of the West Branch of Castle River, light damage to alpine fir and spruce was evident. In the Porcupine Hills, and north of the Kananaskis Forest Experiment Station, numerous larvae were found and light damage to smaller trees was seen. This was also true of the area near Cameron Lake and 2 miles west of Red Rock Canyon in Waterton Lakes National Park. In all other areas where black-headed budworm was found, few larvae were collected and the damage was very light.

Forest tent caterpillar, Malacosoma disstria Hbn.

The forest tent caterpillar appeared to be on the increase throughout southern Alberta. Although shelterbelts in the area between Lethbridge and Taber had numerous colonies of these insects, there was very little damage caused. In a few shelterbelts north of Coaldale, large numbers of larvae could be seen. Throughout the city of Lethbridge clusters of tent caterpillars were common, and light to moderate defoliation of individual trees was seen. A spraying program carried on by the city helped to reduce populations of this insect.

Other localities where small clusters or individual larvae and pupae were seen were; Medicine Hat, Cypress Hills, Raymond, Hillcrest and west of Nanton.

Tent caterpillars, Malacosoma spp.

Tents of Malacosoma lutescens (N. & D.) and Malacosoma pluviale (Dyer) were commonly found throughout the district in 1957. Wild rose, chokecherry and various species of small fruits in orchards in the Medicine Hat, Brooks and Taber districts, suffered moderately heavy defoliation by larvae of these tent caterpillars. In the Waterton Lakes National Park and from Pincher Creek to Coleman, numerous tents of these insects were found, but

were much less numerous than in the eastern part of the District.

American poplar beetle, Gonioctena americana (Schaeff.).

Moderate defoliation of small aspen, by larvae and adults of the American poplar beetle was seen in the following places: along Red Rock Canyon Road in Waterton Lakes National Park, along Dutch Creek and the Northwest Branch of the Old Man River in Crowsnest Forest Reserve, 14 miles west of Longview in the Bow River Forest Reserve, and in small patches throughout the Porcupine Hills. A heavy infestation occurred in a small area 25 miles north of Lundbreck. Light infestations were found 16 miles west of Stavely, 7 miles west of Nanton, around the Jumping Pound and Elbow Ranger Stations, along the Belly River north of Cardston, 1 mile south of Coleman, and throughout the Cypress Hills.

Fall cankerworm, Alsophila pometaria (Harr.).

As in past years, the fall cankerworm continued to be a serious pest of Manitoba maple, ash and elm in farm shelterbelts. In the Lethbridge, Taber and Medicine Hat districts varying degrees of defoliation were observed. The heaviest damage was found in the following areas: Etzikom, Foremost, Whitelaw, Burdett and Taber. Moderate infestations were common from Coaldale to Taber and Vauxhall, and in the Warner - Milk River area. There were some shelterbelts near Claresholm where light infestations were found and one shelterbelt on the west side of Claresholm was moderately defoliated. In the Agricultural District of Brooks only two locations were found in which fall cankerworm was present. One of these was a heavy infestation near Scandia and the other was northeast of Brooks where a trace of damage was evident.

A pine root weevil, Hylobius sp.

Evidence of damage to lodgepole pine by pine root weevil was found at 2 locations. Five miles west of the Jumping Pound Ranger Station 8 out of the 10 trees examined showed evidence of previous attack. No new damage could be found. In the Cypress Hills where 38 trees were examined, 34 either had been or were presently infested

A spruce weevil, Pissodes sp.

Light infestations of this shoot borer were found throughout the Castle District, the south part of the Coleman District in the Crowsnest Forest Reserve, and along the Cameron Lake Road in Waterton Lakes National Park.

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

Ornamental spruce trees in the town of Bowness, and some spruce shelterbelts east of Indus and south of Langdon Corner suffered moderate defoliation as a result of feeding by larvae of this sawfly. Small native white spruce southeast of the Gap Range Station in the Crowsnest Forest Reserve suffered heavy defoliation again this year. In Waterton Townsite, planted spruce sustained light damage by this insect. Larvae were found in numerous other places in the district but the damage was negligible.

Spruce spider mite, Oligonychus ununguis (Jac.).

Moderate infestations of spruce mite have caused some discoloration and loss of needles from ornamental spruce trees in the city of Medicine Hat and in the towns of Taber, Brooks and Claresholm. A few farm shelterbelts in the vicinity of Taber also had moderate infestations of spruce mite.

Pine needle scale Phenacaspis pinifoliae (Fitch).

In the Cypress Hills a very light infestation of pine needle scale on lodgepole pine was found $\frac{3}{4}$ of a mile south of Elkwater Townsite. The area covered by this infestation was about $\frac{3}{4}$ of a mile long and 300 yards wide.

Near Hillcrest, where an infestation has prevailed for the past few years, tree growth has been seriously retarded. There has been a high percentage of needle-drop and the 1957 growth was very poor. Here the infestation is on the decline.

Approximately $\frac{1}{2}$ mile south of Coleman, another heavy infestation has caused some discoloration of foliage and needle-drop. The population of the twice stabbed lady beetle, chilocorus stigma (Say) is building up in this area and may help to control the outbreak.

Other very light infestations were found 5 miles south of Burmis and at Island Lake west of Coleman.

With the exception of the infestation south of Burmis, lodgepole pine was the only host, although spruce and Douglas fir were present in the stands. At Burmis the host was Douglas fir.

Bruce spanworm, Operophtera bruceata (Hulst.).

A sudden increase in the population of this species resulted in very noticeable defoliation of aspen west of Number 2 Highway from Calgary south into Waterton Lakes National Park. However, because of a considerable amount of an unexplained clumping of aspen, it is hard to give any overall picture of defoliation by Bruce spanworm. Heavy damage occurred

in the southern portion of the Porcupine Hills, at the Experimental Range Station west of Stavely, west of Calgary, and north of Burmis and Lundbreck. Light damage was seen south and west of Pincher Creek and in the Castle District of Crowsnest Forest Reserve. In Waterton Lakes National Park, light defoliation of mountain maple, aspen, honeysuckle and various small shrubs was in evidence from Waterton Townsite south to the International Boundary.

Although aspen and willow were the preferred hosts, all broad-leaved trees and shrubs were attacked.

A leaf-tier, Compsolechia niveopulvella Cham.

Leaf tiers of this species were found wherever aspen occurred in the district. Areas in which rolled leaves were numerous were: Allison Creek, 20 miles north of Lundbreck, and 4 miles west of Calgary. In these areas, although rolled leaves were numerous, the resulting damage was light. All other areas had only a few rolled leaves and the damage caused was negligible.

Spiny elm caterpillar, Nymphalis antiopa (L.).

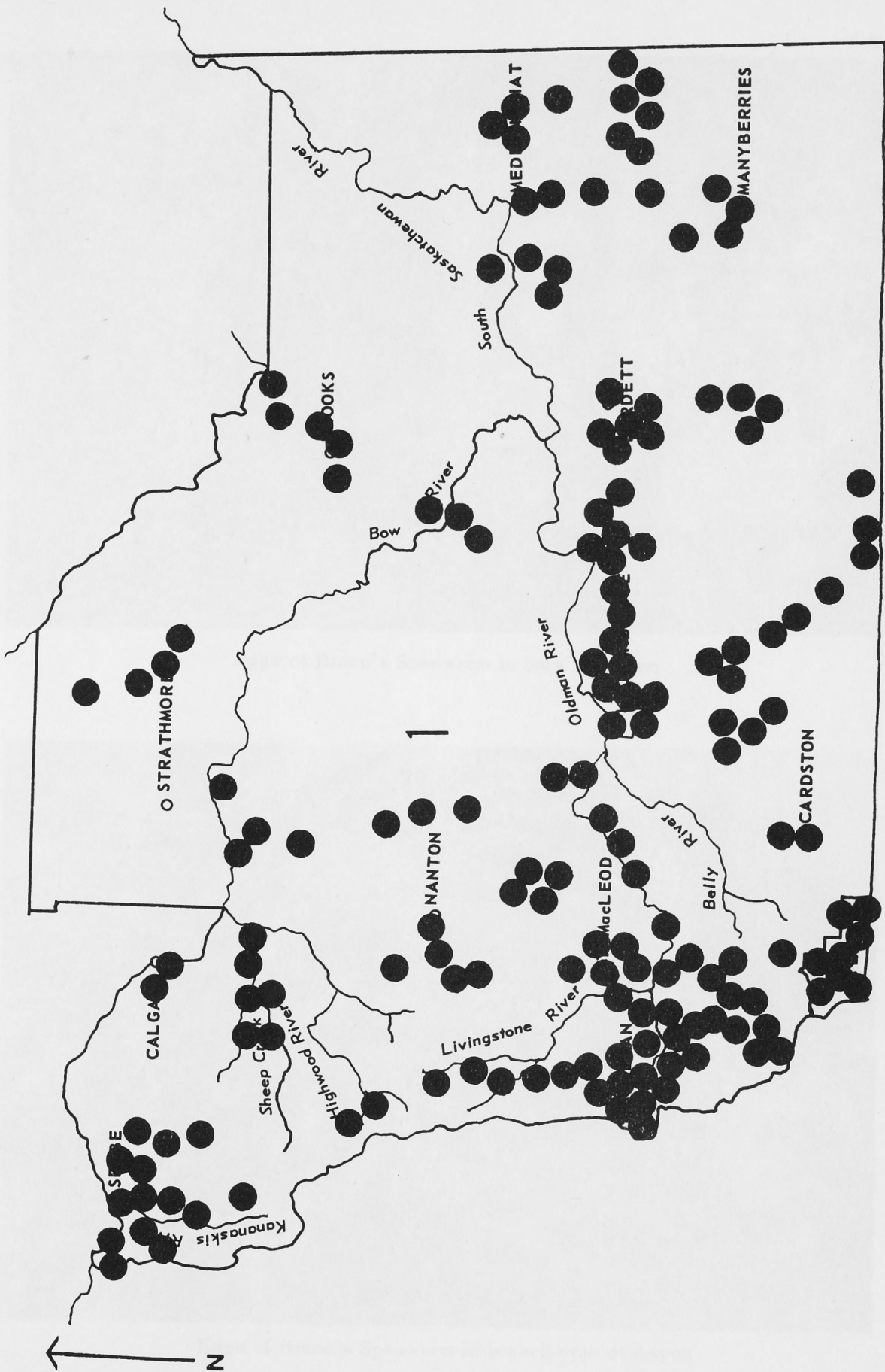
Colonies of spiny elm caterpillar were found frequently in various places in the western part of the district. The majority of these colonies was found at Claresholm, Waterton Lakes National Park and around the Blaremore - Coleman area. Other places where colonies were seen were: Warner, Raymond, Ft. McLeod, Lundbreck and the Kananaskis Forest Experiment Station. Although most commonly found on willow, other hosts included elm, balsam poplar and saskatoon.

Cecropia, *Hyalophora cecropia* (L.).

After an absence of several years, larvae and pupae of this silkworm moth were again found in southern Alberta. The District Agriculturist at Taber reported that larvae were numerous at a farm shelter-belt south of this town. A collection containing pupae and a few diseased larvae was made near Bow Island.

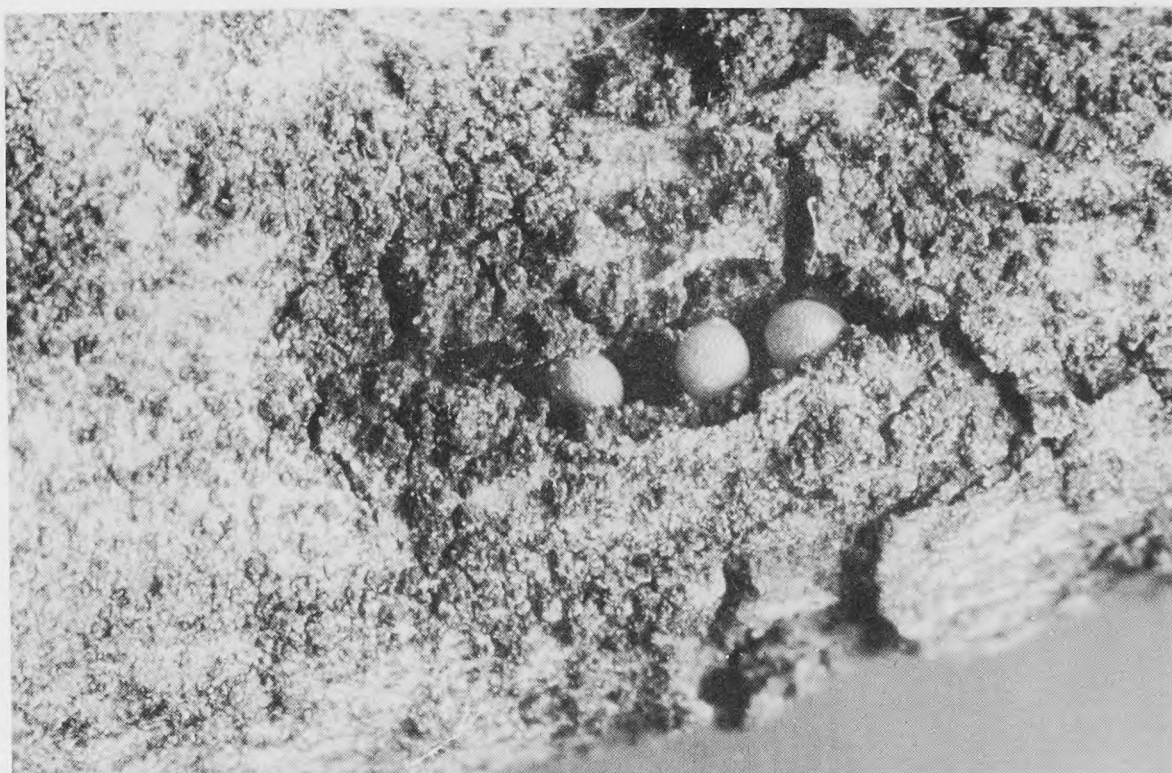


CROWSNEST - BOW RIVER DISTRICT



Location of points where collections or field records were taken in 1957.

SCALE
(28 MI. = 1 IN.)
APPROX.



Eggs of Bruce's Spanworm in bark of Aspen



Eggs of Bruce's Spanworm in branch stub of Aspen



Defoliation of understory by Bruce's Spanworm



Defoliation of Aspen by Bruce's Spanworm



Webbing on Aspen caused by Bruce's Spanworm



Webbing on Willow caused by Bruce's Spanworm

FOREST BIOLOGY RANGER REPORT

CLEARWATER DISTRICT

ALBERTA 1957

by

P.F. LARUE

FOREST BIOLOGY LABORATORY

CALGARY, ALTA.

CANADA DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

FOREST BIOLOGY DIVISION

MARCH 1958

INTRODUCTION

The 1957 field survey to determine the status of forest insect and disease activities in Forest Biology Ranger District 2 commenced May 17, and terminated September 17. This district consists of the Clearwater Forest Reserve, that portion of the Bow River Forest Reserve north of the Bow River and the agricultural lands east to the Saskatchewan Boundary.

During the season, a total of 322 insect and 4 disease samples was submitted. Eleven samples were received from co-operators in the district.

Field accommodation consisted of a 24 foot house trailer and a tourist tent which was used on extended trips. A half-ton Ford panel truck was used for transportation. This type of vehicle would be adequate if equipped with a winch that could be used in the more inaccessible areas of the district which are being opened up by oil companies and timber operators.

Ten days were spent with V. Patterson in districts 2, 5 and 6 on sequential sampling of larch sawfly. The last 2 weeks in September were spent assisting personnel from the Forest Pathology Laboratory in examining slash and recording pathological data at Strachan. At the request of the Federal Forestry Branch, data were again collected from spruce seed plots. Four days were spent on this project.

Distribution and damage appraisal surveys in the agricultural section of the district showed that the yellow-headed spruce sawfly and the balsam fir sawfly were in outbreak proportions. Infestations of the American poplar beetle on aspen and the larch sawfly on tamarack caused some defoliation in the forested areas. The occurrence of spruce spider mite was less frequent and damage lighter than in previous years. Two leaf-tiers, the large aspen tortrix and Compsolechia nivipulvella Chamb., in conjunction

with the Bruce spanworm caused conspicuous striping of aspen in both the agricultural and forested areas of the district.

TABLE 1

Insect Collections
by Host Trees

Coniferous Hosts.	No. Coll.	Deciduous Hosts.	No. Coll.
White spruce	138	Trembling aspen	26
Lodgepole pine	34	Willow	23
Larch	28	Alder	23
Fir	2	Birch	20
	202	Shepherdia	4
		Cottonwood	3
		Manitoba maple	3
		Elm	3
			105
Misc.			15
		GRAND TOTAL	322

INSECT CONDITIONS

Larch sawfly, Pristiphora erichsonii (Htg.).

Light populations of this sawfly were found in the Sundre, Caroline, Rocky Mountain House and Nordegg areas, but little defoliation was evident. In the Winfield, Buck Lake and Alder Flats regions and north to the North Saskatchewan River, populations were higher. Light defoliation was observed on fringe trees and the upper crowns of the trees within these stands. The following table gives the results of sequential sampling in the larch sawfly plots.

TABLE 2

Results of Sequential Sampling
Larch Sawfly Permanent Sample Plots

Stn. No.	Location	Infestation Class	Cocoons Collected	Cocoons Moused
2 - 1	Yoeford	Light	144	5
2 - 2	Rocky Mountain House	Light	6	0
2 - 3	Nordegg	Light	0	0
2 - 4	Clearwater	Light	56	1
2 - 5	Caroline	Light	11	0

A pine root weevil, Hylobius sp.

Larvae and galleries of this weevil were found in most of the pine stands throughout the Clearwater Forest Reserve. The known distribution of this insect remained much the same as in 1956 with the exception of two areas where it had not previously been reported. One of these areas was 25 miles north of Nordegg on Chungo Creek, the other, at a point 20 miles south of the Clearwater Ranger Station on the East Slope Road. In both of these areas, fresh galleries were observed.

American poplar beetle, Gonioctena americana (Schaeff.).

Areas where previous outbreaks of this beetle occurred at Saunders and west of Sundre were inspected and no major changes were apparent. Light defoliation was in evidence. Adults and larvae were found feeding on aspen in a strip running from Water Valley to a point 8 miles west. Mature as well as regeneration trees were heavily attacked and small patches were completely defoliated. Another outbreak covering approximately 40 acres was found one mile west of Bearberry. Young trees along the edge of this stand were heavily defoliated.

Large aspen tortrix, Choristoneura conflictana (Wlk.).

The large aspen tortrix in conjunction with a leaf-tier, Compsolechia niveopulvella Chamb., caused conspicuous defoliation throughout the forested and agricultural regions of the district. Defoliation in this outbreak ranged from light to heavy and in no instances were aspen trees found to be free of these insects. In the agricultural district, the heaviest infestations occurred in a block running north of Calgary to Red Deer, east to Stettler and south to the Drumheller - Hanna area. In the remaining farming districts, populations fell in the light to medium categories.

In the forested areas of the district, populations were found to be generally lighter than in the agricultural sections. Defoliation ranged from light in the Ghost and Red Deer Forest Districts to heavy from Rocky Mountain House to the North Saskatchewan River.

Yellow-headed spruce sawfly., Pikonema alaskensis (Roh.).

The present outbreak of this insect on ornamental and shelter belt trees in the agricultural section of the district was more severe than in 1956. In the Lacombe - Red Deer area and east to Stettler, populations were high with defoliation heavy in many plantations. In the Olds - Acme district east to Drumheller and north to Big Valley populations were heavy with some tree mortality. The accompanying map shows distribution and infestation ratings.

Spruce spider mite, Oligonychus ununguis (Jac.).

The previous annual report for this district indicated that this mite had increased considerably in the agricultural district. This year populations were found to be moderately light with little new damage observed. It is thought that heavy rains during June and July washed many

of the mites from the trees. This mite was found in both the forested and agricultural areas and with favourable weather conditions, populations could again build up to outbreak proportions.

Woolly elm aphid, Eriosoma americanum (Riley).

The distribution of this aphid on elm was extensive in the agricultural areas of this district. Heaviest populations were observed in the Drumheller - Delia areas and north to Big Valley and around Penhold and Stettler.

Caragana aphid, Macrosiphum caraganae (Cholod).

These aphids caused serious damage to caragana in the Craigmile, Watts and Hanna areas. North of Watts, leaves and pods were heavily infested on the shelterbelts of all the farms visited.

Spiny Elm caterpillar, Nymphalis antiopa. (L.).

Larvae of this caterpillar appear to be on the increase in the vicinity of Drumheller, feeding on elm and willow. Only in the city of Drumheller were populations high enough to cause defoliation. Isolated clusters were observed in the Delia region and south into the Hand Hills.

Neodiprion sp. on spruce.

Defoliation by this sawfly was in evidence in farm shelterbelts in the Drumheller area around Munson, Rumsey, Hesketch and Delia. Larvae were taken in large numbers at a farm 6 miles east of Stettler. There were light to medium infestations between Red Deer and Ponoka with noticeable defoliation east of Lacombe around Bashaw and Clive.

West of Rimbey, where the forested and agricultural areas merge, populations were moderate with light defoliation observed in some shelterbelts.

In the forested area of the district, light populations were found from the Red Deer Ranger Station to the northern Boundary of the district.

Neodiprion sp. on Lodgepole pine.

This sawfly on pine was recorded generally throughout the district. Heaviest populations were found in the vicinity of Rocky Mountain House and west to Nordegg. No defoliation of pine was evident.



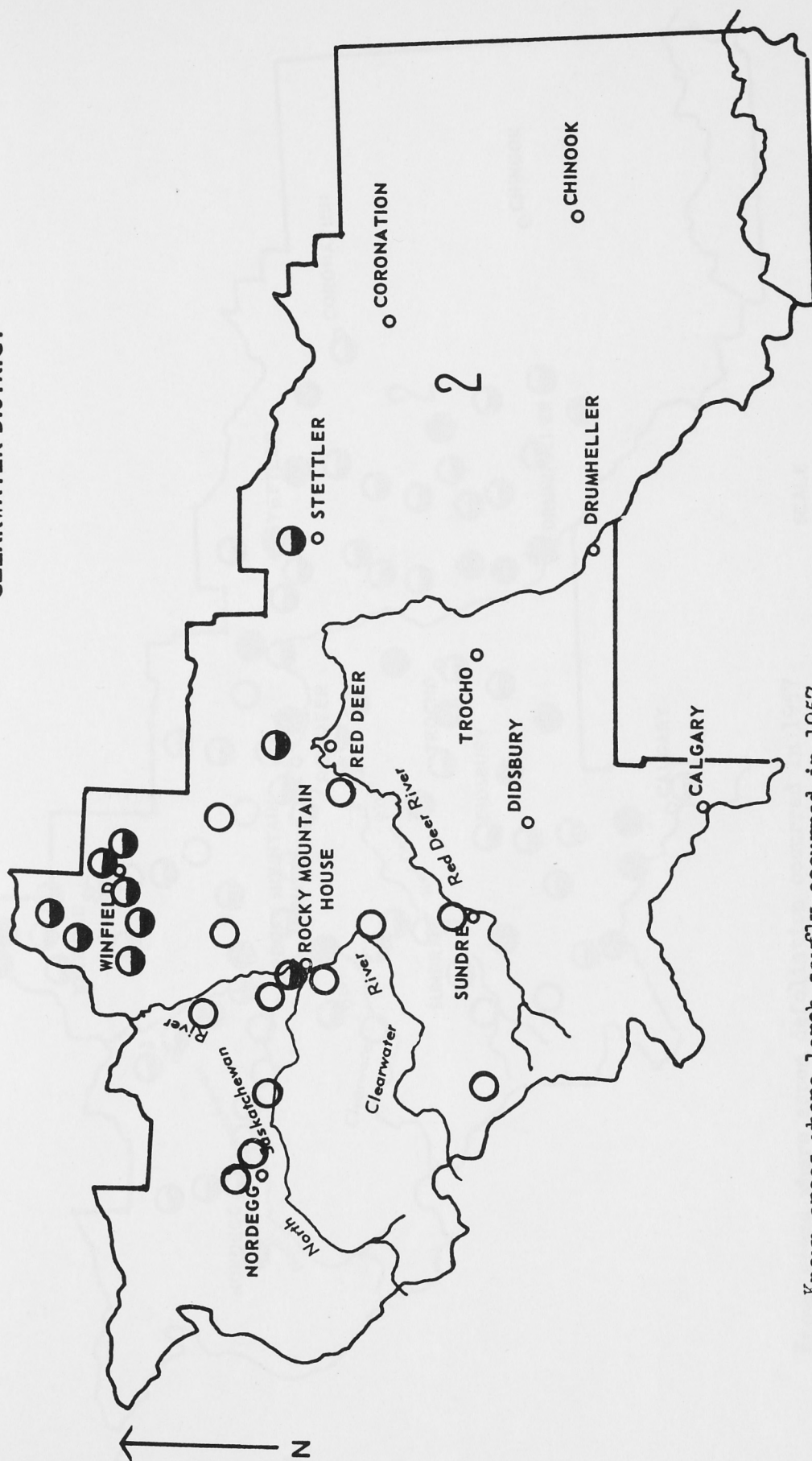
Location of points where collections of field records were taken in 1957.

A map of the Clearwater District showing sampling locations. The map includes labels for towns such as WINFIELD, ROCKY MOUNTAIN, RED DEER, STETTLE, CORONATION, CHINOOK, TROCHO, DIDSBURY, SUNDRE, UMBRELL, and CALGARY. It also shows the Bow River, Red Deer River, and the Canadian border. A north arrow is present in the bottom left corner.

A vertical number line with tick marks at 0, 10, 20, 30, and 40.

Location of points where collections or field records were taken in 1957.

CLEARWATER DISTRICT

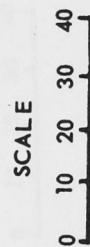


Known areas where larch sawfly occurred in 1957.

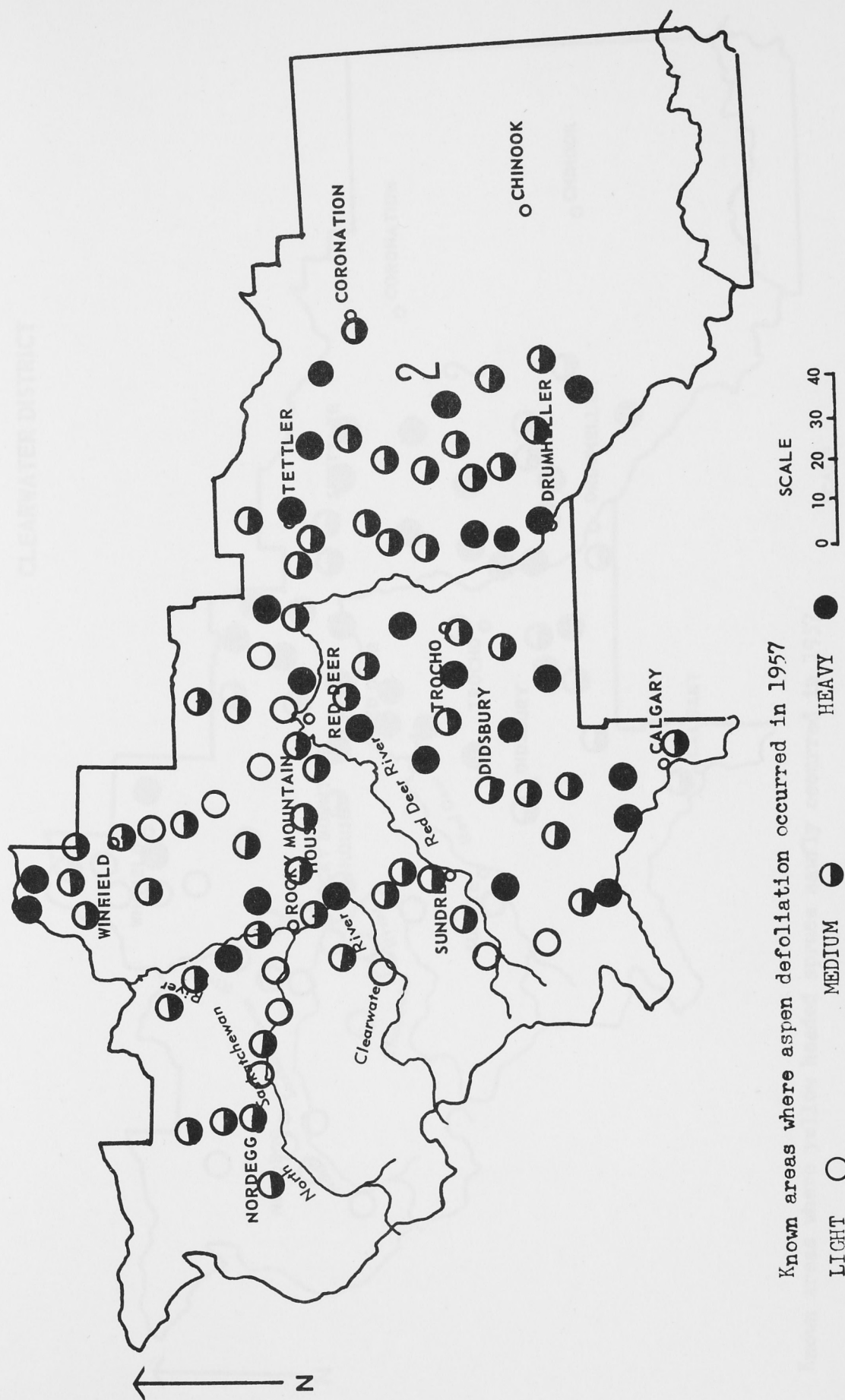
LIGHT ○

MEDIUM ●

HEAVY ●



CLEARWATER DISTRICT



Known areas where aspen defoliation occurred in 1957

LIGHT ○

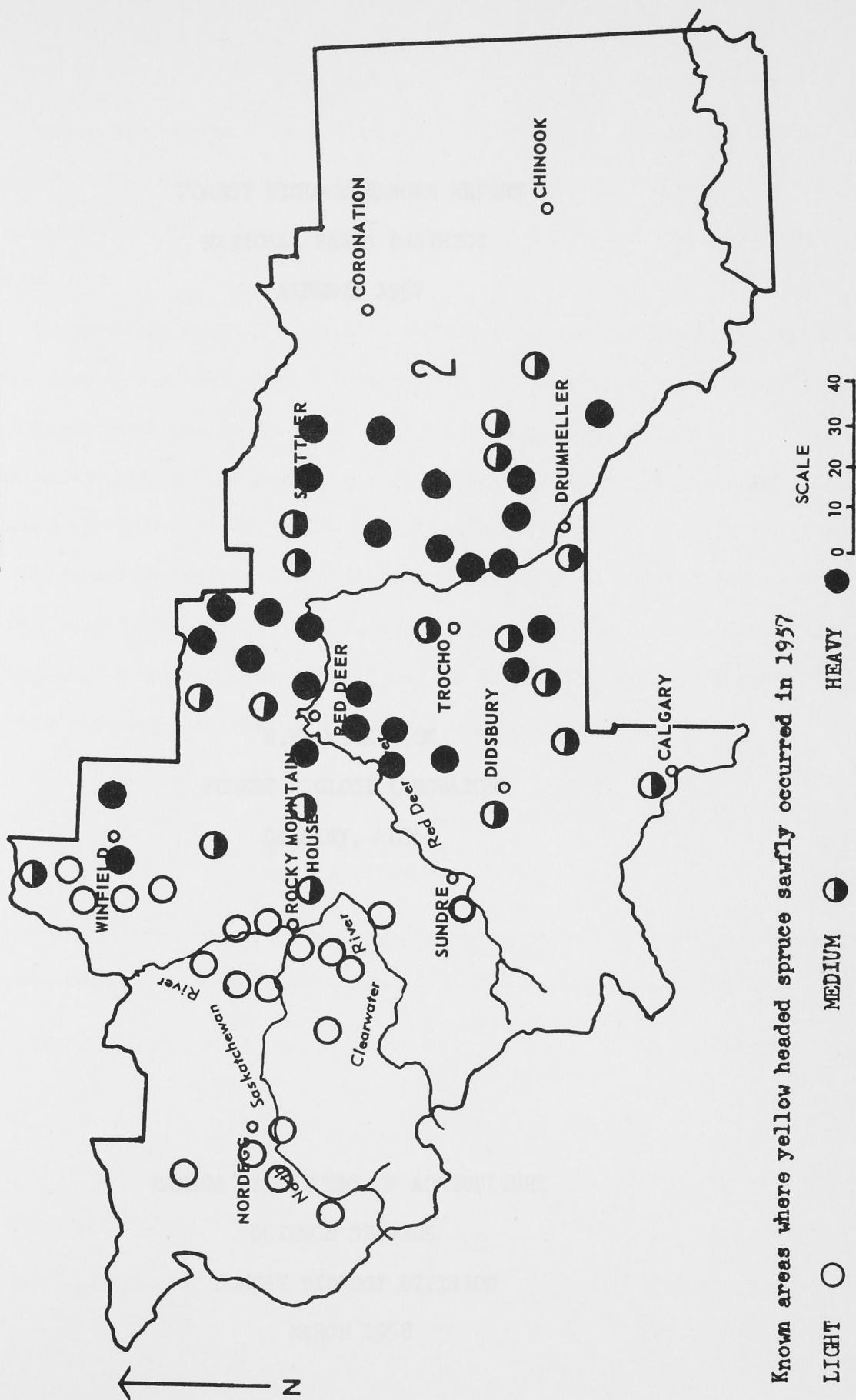
MEDIUM ◐

HEAVY ●

SCALE

0 10 20 30 40

CLEARWATER DISTRICT



INTRODUCTION

The following is a report on survey activities in the National
Parks District. The FOREST BIOLOGY RANGER REPORT of May and ended on the
31st of September in 1957. NATIONAL PARKS DISTRICT collections and 4 disease
samples submitted.
ALBERTA 1957

Accompanied by C. E. Brown, a detailed survey to determine spruce
spider mite damage was made during late August in Jasper and Banff townships.

Assistance was given to J. Petty over a period of 15 days
during the latter part of September and first of October in determining
damage caused by bark beetles in the Castle River area.

Spruce budworm was found in Yoho National Park causing light
damage. One mass collection of 500 larvae was sent to the Vernon Laboratory
for Dr. Freeman. A spruce weevil was found to be killing tops of regeneration
spruce in the Kootenay Crossing area of Kootenay National Park.
by
N.W. WILKINSON

FOREST BIOLOGY LABORATORY

CALGARY, ALTA.

Coniferous Hosts.	No. Coll.	Deciduous Hosts.	No. Coll.
Spruce	61	Trembling aspen	25
Laricinae pine	41	Willow	16
White fir	37	Balsam poplar	9
Larch	6	Alder	7
Douglas fir	4	Birch	7
	149		62
CANADA DEPARTMENT OF AGRICULTURE		17	
SCIENCE SERVICE		230	
FOREST BIOLOGY DIVISION			

MARCH 1958

INTRODUCTION

The following is a report on survey activities in the National Parks District. The Field Season began on the 21st of May and ended on the 3rd of September in 1957. There were 230 insect collections and 4 disease samples submitted.

Accompanied by C. E. Brown, a detailed survey to determine spruce spider mite damage was made during late August in Jasper and Banff townsites.

Assistance was given to J. Petty over a period of 15 days during the latter part of September and first of October in determining damage caused by bark beetles in the Castle River area.

Spruce budworm was found in Yoho National Park causing light damage. One mass collection of 500 larvae was sent to the Vernon Laboratory for Dr. Freeman. A spruce weevil was found to be killing tops of regeneration spruce in the Kootenay Crossing area of Kootenay National Park.

TABLE 1

Insect Collections
by Host Trees

Coniferous Hosts.	No. Coll.	Deciduous Hosts.	No. Coll.
Spruce	61	Trembling aspen	25
Lodgepole pine	41	Willow	16
Alpine fir	37	Balsam poplar	9
Larch	6	Alder	7
Douglas fir	4	Birch	7
	<u>149</u>		<u>64</u>
Misc.			17
		GRAND TOTAL	230

INSECT CONDITIONS

Lodgepole needle miner, Recurvaria starki Free. This budworm was also found

The density of needle miner populations in the National Parks District remained low in 1957 and occurrence was generally restricted to higher elevations. The greatest numbers were found at the 5,400 ft. level on Mount Eisenhower 22 miles west of Banff. Defoliation is estimated to be less than 20 per cent and no mortality of trees from the current infestation is likely.

Spruce budworm, Choristoneura fumiferana (Clem.).

Light defoliation caused by this insect was evident in Yoho National Park. Larval populations were more numerous in the area from the Otterhead River on King Mountain Fire Road, where the heaviest population was found, to a point 9.4 miles up the Amiskwi Valley. Other locations where these insects were collected were at Kicking Horse Camp Ground in Yoho National Park and between mile 84 and 85 along the Banff - Jasper Highway in Banff National Park. Moth flight year for the 2 year life cycle spruce budworm in the National Parks will take place in 1958 and feeding by late instar larvae may result in considerably more damage than was evident in 1957.

Black-headed budworm, Accleris variana (Fern.).

Light populations of this insect were found in the 4 National Parks covered by this report. Damage was confined to current year's foliage and defoliation was light. In Yoho National Park specimens were collected at Kicking Horse Camp Ground, 9.4 miles up the Amiskwi Valley and for 3.3 miles up the Yoho Valley. Collections of this insect were taken in Banff townsite from 7 miles up the Cascade River Valley to Banff townsite and from the

townsite east in the Bow Valley to Carrot Creek. This budworm was also found in the valleys of Brewster Creek, Healy Creek and Taylor Creek. Light damage was encountered at mile 83 on the Banff-Jasper Highway. In Kootenay National Park these insects were found near Black's Camp Ground, Kimpton Creek and 8 miles south of Kootenay Crossing. Jasper National Park had very light populations at the Park boundary on the Jasper - Edmonton Highway and around mile 17.9 on the Medicine Lake Road.

Larch sawfly, Pristiphora erichsonii (Htg.).

The only location in the National Parks District where larch sawfly damage was found was in a small stand of larch at mile 4 on the Miette Hot Springs Road. Defoliation was light and confined to a very few branch tips.

A pine root weevil, Hylobius sp.

These insects were found in Yoho and Kootenay national parks. Approximately $\frac{1}{4}$ mile west of Chancellor Camp Ground in Yoho National Park, 2 adults, 7 larvae and 2 eggs were collected from 5 trees examined. In Kootenay National Park these weevils were found to be more plentiful and widespread. Collections were made near Dolly Varden Camp Ground where 3 adults, 3 pupae and 9 larvae were taken from 10 trees examined. All trees had sustained weevil damage. Specimens were also collected at points 2 miles and 5 miles south on the Settlers Road and at 8.2 and 10.7 miles south along the fire road on the east side of the Kootenay River. Mortality of lodgepole pine was evident in both of these parks. No damage was found or specimens taken in Banff or Jasper national parks.

A spruce weevil, Pissodes sp.

This insect was found in Yoho and Kootenay national parks. North of the Ottertail River Bridge and at Chancellor Camp Ground in Yoho National Park, tops of open grown regeneration spruce were being killed by this weevil. This infestation covered a very small area. In Kootenay National Park populations were much higher. Regeneration spruce in an area $\frac{1}{2}$ mile square, north-west of Kootenay Crossing, suffered heavy damage. Weevils and resulting injury were also found from this area to the south boundary of the Park. At mile 2, south on Settlers Road, 10 lodgepole pine with dead leaders were examined. These leaders were found to be damaged by weevils.

Spruce spider mite, Oligonychus unungis (Jac.).

A detailed survey of spruce and fir trees within the townsites of Banff and Jasper was made in mid-August to determine the damage caused by this mite. In Jasper townsite this survey revealed only 1 or 2 locations where mite populations were heavy enough to cause concern. Spraying was recommended for spruce trees at these locations and for infested ornamental Koster blue spruce in the townsite. There was evidence that spruce mite populations had built up rapidly in the spring, but that unfavourable weather had prevented them from causing much damage. In Banff townsite evidence showed that the spruce mite had been very heavy early in the year, and although there were hundreds of skin casts on the twigs, few live mites or viable eggs were present except in very sheltered locations. The above situation appears to be directly attributable to the weather in the area this year. Warm, dry weather early in the year allowed populations to build up rapidly; during July

and August the weather was cold and wet, and there were heavy driving rains. Cold, wet weather is unfavourable to the growth and development of the spruce mite and resulted in a great reduction in their numbers.

Gall aphids on Conifers, Adelginae.

Galls of Adelges cooleyi (Gill.) were in evidence on spruce throughout the parks district. Numerous old galls in some locations have caused some aesthetic loss. Galls of Pineous pinifoliae (Fitch.) on spruce were found at the Banff Golf Course.

Bark Beetles, Scolytidae

There was no evidence of damage to live trees found in the Parks District although beetles were found in road slash and windthrown trees. Species of Dendroctonus, Ips and other scolytidae were collected from windthrown white spruce and lodgepole pine along the Amiskwi Valley and at Emerald Lake in Yoho National Park. In Kootenay National Park collections which contained species of Ips and Dendroctonus were taken from white spruce, slash, along the roadside south of Vermilion Crossing.

Leaf rollers on aspen, Compsilechia niveopulvella Cham. and Epinotia sp.

Light damage by these insects was found generally throughout the parks where poplar stands occurred. Collections of C. niveopulvella Cham. were made in Banff, Jasper and Kootenay national parks. Epinotia sp. were collected in the 4 parks covered by this report.

Bruce spanworm, Operophtera bruceata (Hulst.).

Light to moderate leaf damage to willow, balsam poplar, birch, mountain maple and cinquefoil was caused by this insect in the National Parks District. Specimens were taken from willow and balsam poplar

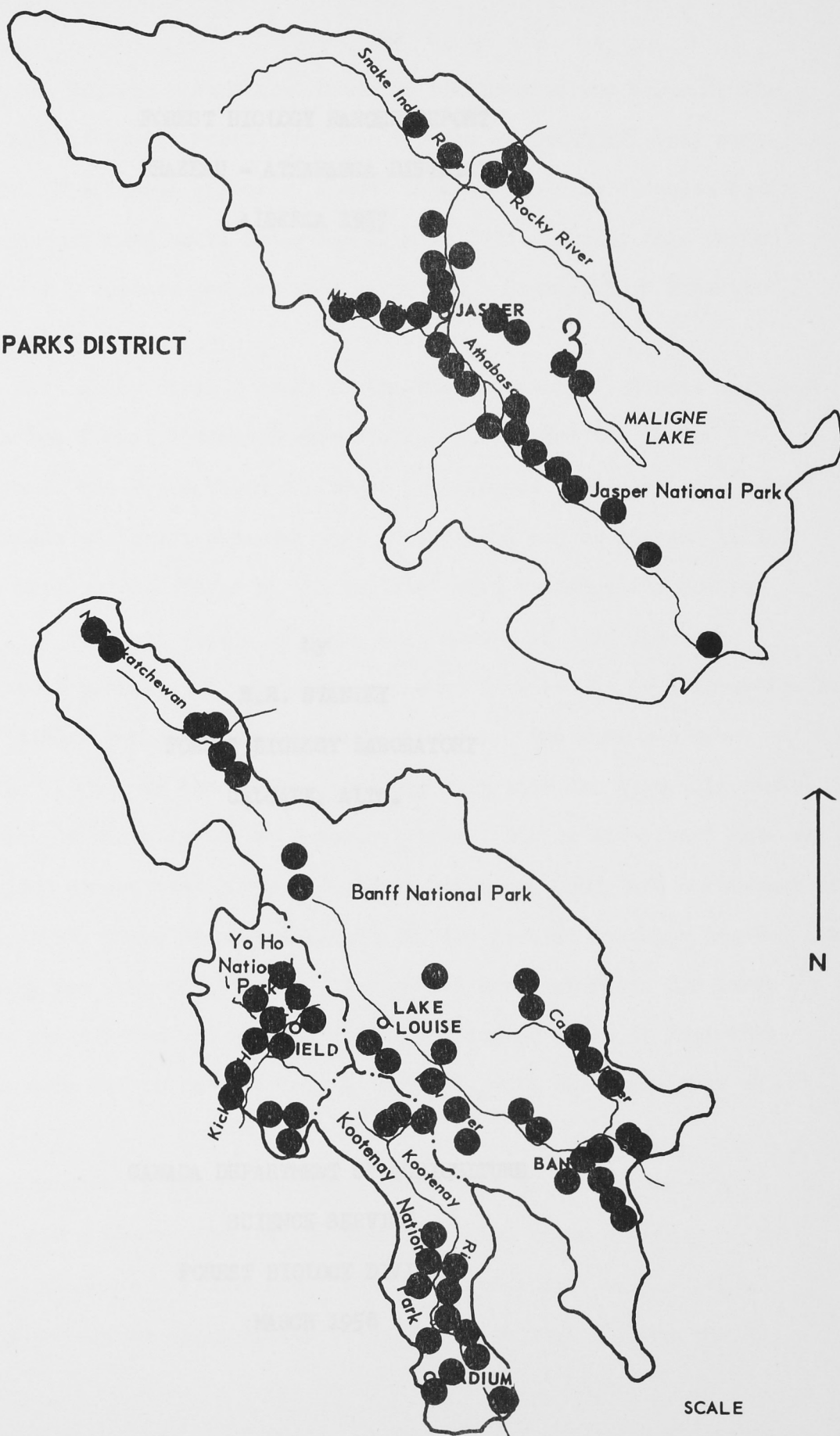
near Fiddle River Bridge in Jasper National Park. In Banff National Park specimens were taken from balsam poplar south of the Carrot Creek Bridge and from willow in the Panther River Lodge area. A light population was found on birch at Radium Hot Springs and on cinquefoil at McLeod Meadows Camp Ground in Kootenay National Park. Light damage had also occurred in the Kimpton Creek area. The only location in Yoho National Park where this insect was collected was in an area approximately 2 miles up the Ice River from the bridge. These collections were taken from willow and mountain maple.

DISEASE CONDITIONS

No new disease outbreaks were found in 1957. Outbreaks reported last year were re-examined and no change was apparent other than a decrease in occurrence of needle cast on lodgepole pine.



NATIONAL PARKS DISTRICT



Location of points where collections or field records were taken in 1957.

(21 MI. = 1 IN.)

FOREST BIOLOGY RANGER REPORT

BRAZEAU - ATHABASCA DISTRICT

ALBERTA 1957

by

R.R. STANLEY

FOREST BIOLOGY LABORATORY

CALGARY, ALTA.

CANADA DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

FOREST BIOLOGY DIVISION

MARCH 1958

INTRODUCTION

The Brazeau - Athabasca District consists of the Edson Forest Division, the Whitecourt Forest Division and the agricultural area west of Edmonton. The annual survey of forest insects and tree diseases began May 15th and continued until September 24th in 1957. During this period 364 insect and 4 disease samples were submitted. Co-operators submitted 3 insect samples.

During the first 2 weeks of the field season, J. Emond, a recent addition to the Forest Biology Ranger Staff, accompanied the author for instructions in the recognition of forest insects and tree diseases. The known outbreaks of forest diseases were re-examined and no changes in the boundaries were noted. Parts of the district were inadequately covered because of the very wet season and the large amount of time spent on specific investigations. A considerable amount of time was used investigating reports of timber damaged by insects and diseases. One week was spent assisting L. C. Wier of the Forest Pathology Unit with the Atropelis canker permanent sample plots in the Robb-Mercoal Area. During mid-August data was collected from spruce seed plots located at Entrance, McKay and North-west of Whitecourt. This work, in co-operation with the Federal Forestry Branch, took approximately one week to complete. Sequential sampling plots for larch sawfly were established and sampled during the last 2 weeks in September. These plots were set up in districts 4, 6 and 7, with the assistance of J. Emond.

There was a general build-up in numbers of Bruce spanworm in the central and western parts of the district. The known boundary of the larch sawfly outbreak was extended. Yellow-headed spruce sawfly caused heavy damage to spruce shelterbelts in the Edmonton area. There was no

notable change in population levels of other insects mentioned in last year's report.

TABLE 1

Insect Collections
by Hosts

Coniferous Hosts.	No. Coll.	Deciduous Hosts.	No. Coll.
White spruce	95	Trembling aspen	106
Eastern larch	61	Willow	18
Lodgepole pine	37	Balsam poplar	7
Jack pine	4	Alder	3
Black spruce	4	White birch	3
Alpine fir	4		137
Juniper	2		
	207		
.....			
Misc.			20
.....			
		GRAND TOTAL	364

INSECT CONDITIONS

Forest tent caterpillar, Malacosoma disstria Hbn.

A few larvae of the forest tent caterpillar were collected in the vicinity of Edmonton; defoliation was negligible.

Larch sawfly, Pristiphora erichsonii Htg.

Evidence of larch sawfly was found in all areas sampled throughout this district. The heaviest infestation was found in the eastern part of the district and gradually decreasing in severity toward the west. In the Barrhead and Ft. Assiniboine districts defoliation was as high as 90 per cent in some stands. In the Stony Plain, Drayton Valley, Evansburg and Sangudo districts damage was moderate. From these points west to Lodgepole, Peers,

and Whitecourt defoliation was light, and farther west no more than a few larvae could be found.

In the Spruce Grove - Edmonton area where defoliation appeared heavy, it was found on close inspection that the damage caused by larch sawfly was medium. The very thin crown was caused by the lack of shoots, and it was thought that the continuous attacks by this insect during the past several years have resulted in a general deterioration of tree vigor.

Nine permanent plots were established in 1957 for sequential sampling of larch sawfly in this district; the results are shown in the following table.

TABLE 2

Results of Sequential Sampling
Larch Sawfly Permanent Sample Plots

Stn. No.	Location	Infestation Class	Cocoons Collected	Cocoons Moused
4 - 1	Edmonton	Severe	92	18
4 - 2	Gainford	Moderate	131	14
4 - 3	Peers	Light	0	0
4 - 4	Mercoal	Light	0	0
4 - 5	Obed	Light	0	0
4 - 6	Muskeg R.S.	Light	0	0
4 - 7	Whitecourt	Moderate	0	4
4 - 8	Iosegun Lake	Light	0	0
4 - 9	Barrhead	Moderate	203	1

American poplar beetle, Gonioctena americana (Schaeff.).

These leaf-eating beetles were found in many widely scattered areas causing light defoliation of aspen. They were feeding in association with the large aspen tortrix and the Bruce spanworm, which made it difficult to estimate the amount of damage for which they were responsible. Judging

by the number of beetles present and the type of feeding, it was thought that they contributed little toward the defoliated condition of the trees. Areas in which they were recorded were: between Mayerthorpe and Carvel, in the vicinity of Onoway, at Drayton Valley, Duffield, Bickerdike, McLeod River, Entrance, Tomahawk and along Highway No. 16 from Carvel to Entwhistle. Most of the defoliation caused by these beetles was on the smaller trees.

Defoliation of Aspen by Tortricidae, Gelechiidae and Geometridae.

Defoliation of aspen, ranging from light to very heavy, was recorded throughout the Brazeau - Athabasca District during May and June. Insect species responsible for the damage were: the large aspen tortrix, Choristoneura conflictana (Wlk.), Bruce spanworm, Operophtera bruceata (Hlst.) and a Gelechiidae, Compsolechia niveopulvella Cham. The combination of these three species feeding together in most areas made it difficult to determine the amount of damage caused by any one.

In the area around Obed, and extending north-eastward to a point approximately 40 miles north of Marlboro, the greatest damage was caused by Bruce spanworm. Throughout this area defoliation was as high as 90 per cent in scattered patches. Other locations where these loopers were responsible for the majority of the damage were: in a small patch approximately 60 acres in size, 2 miles north-east of Robb; and a larger patch covering nearly 2 sections, 35 miles north of Peers along the Peers - Whitecourt Road.

Small areas of heavy defoliation were found in the districts of Stony Plain, Tomahawk, Drayton Valley, Lodgepole, and along the north side of the Saskatchewan River from the bridge near Devon to about 15 miles south-west of Lodgepole. Field observations throughout this section indicated that,

although C. niveopulvella and Bruce spanworm were present in fairly high numbers the large aspen tortrix was responsible for at least 50 per cent of the defoliation. This leaf-roller also caused heavy damage from Whitecourt east to Mayerthorpe, and south for approximately 20 miles along the road to Wildwood. The only other places where this species outnumbered the other two to any great extent, were in the vicinities of Sandy Lake, Onoway, Calahoo, and Heatherdown where defoliation was moderate to heavy in widely scattered patches.

Throughout the remainder of the district these 3 species caused light to medium defoliation.

In the Obed area, where Bruce spanworm populations were high, there was a very heavy concentration of hymenopterous parasites. This could possibly reduce the numbers of spanworm present next year.

Pine root weevil, Hylobius sp.

Several reports of weevils killing mature lodgepole pine in the Robb-Embarras area were checked in 1957. Inspections of these stands indicated that although there was a high population of these insects in the area, it is doubtful if they are solely responsible for any tree mortality. Of 40 trees thoroughly examined, 36 were damaged by weevils but none were completely girdled.

Dead trees and dead branch tips were evident in this district and the foliage had a brown appearance. Tree diseases Armillaria mellea (Vahl. ex. Fr.) Quel. and Atropellis piniphila (Weir.) Lohman & Cash. were found. Weather damage was reported in this area in 1956. It is believed that a combination of these factors was responsible for the poor condition of this stand.

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.).

As in previous years, the yellow-headed spruce sawfly caused heavy defoliation to nearly all spruce shelterbelts and ornamental trees in the portion of the district lying east of a line running from Barrhead to Tomahawk. Of the many shelterbelts inspected, it was estimated that at least 60 per cent were suffering moderate to heavy attacks by these sawflies. In the Stony Plain and Spruce Grove districts many of the farmers are well acquainted with the habits of this insect and had sprayed their trees. In cases where no insecticide had been applied, defoliation was heavy. Other places where heavy defoliation occurred were: Tomahawk, Duffield, Onoway, Calahoo, and Devon. Larvae were numerous on open grown native trees south of Stony Plain along the north side of the Saskatchewan River.

Hymenopterous parasites were numerous in many locations where these sawflies were found.

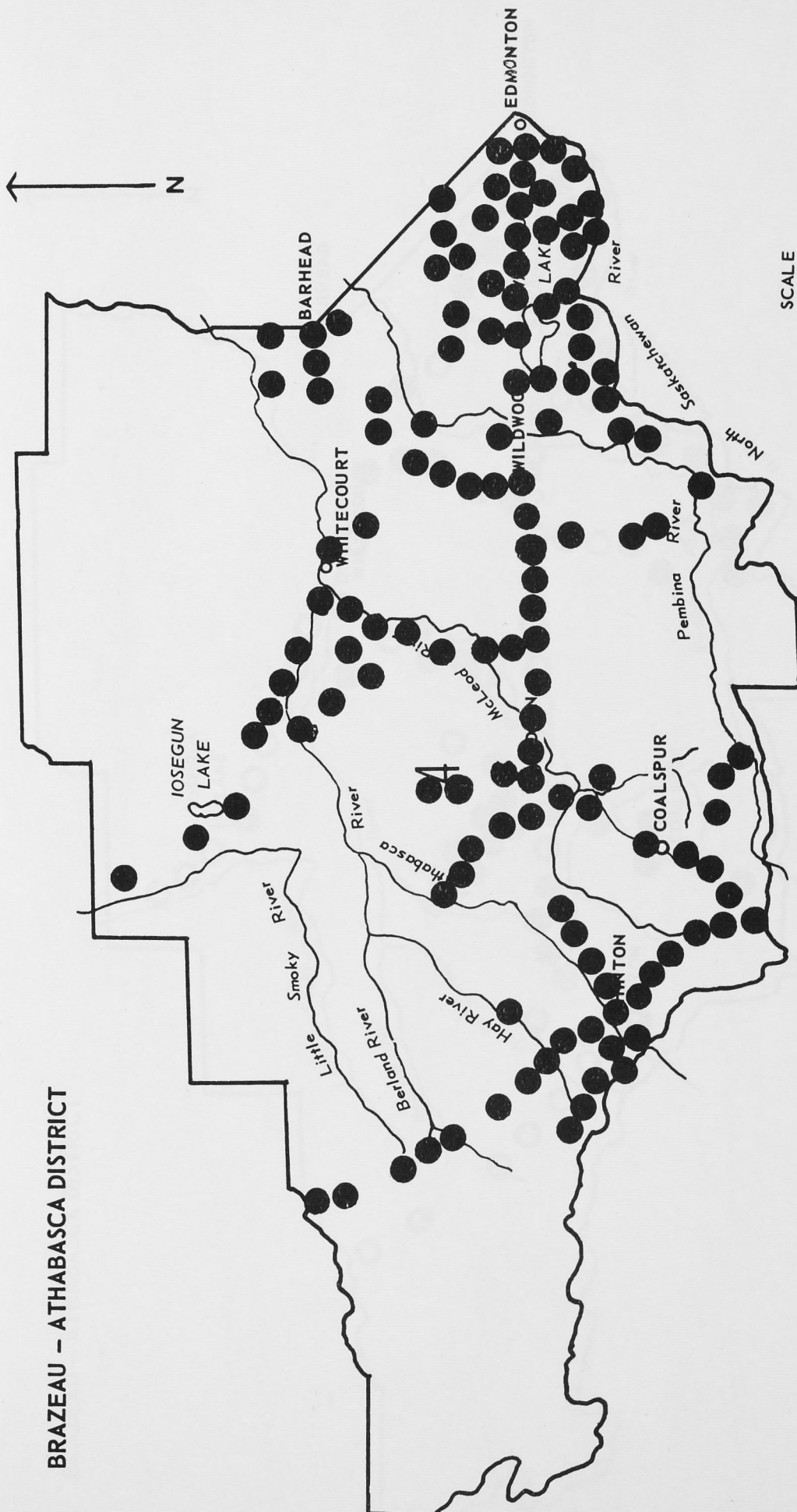
Spruce spider-mite, Oligonychus ununguis (Jac.).

Ornamental spruce in a small area around Wabamun were suffering from a moderate attack by this pest. They were not found elsewhere in the district.

Needle-miner, Recurvaria prob. canusella Free.

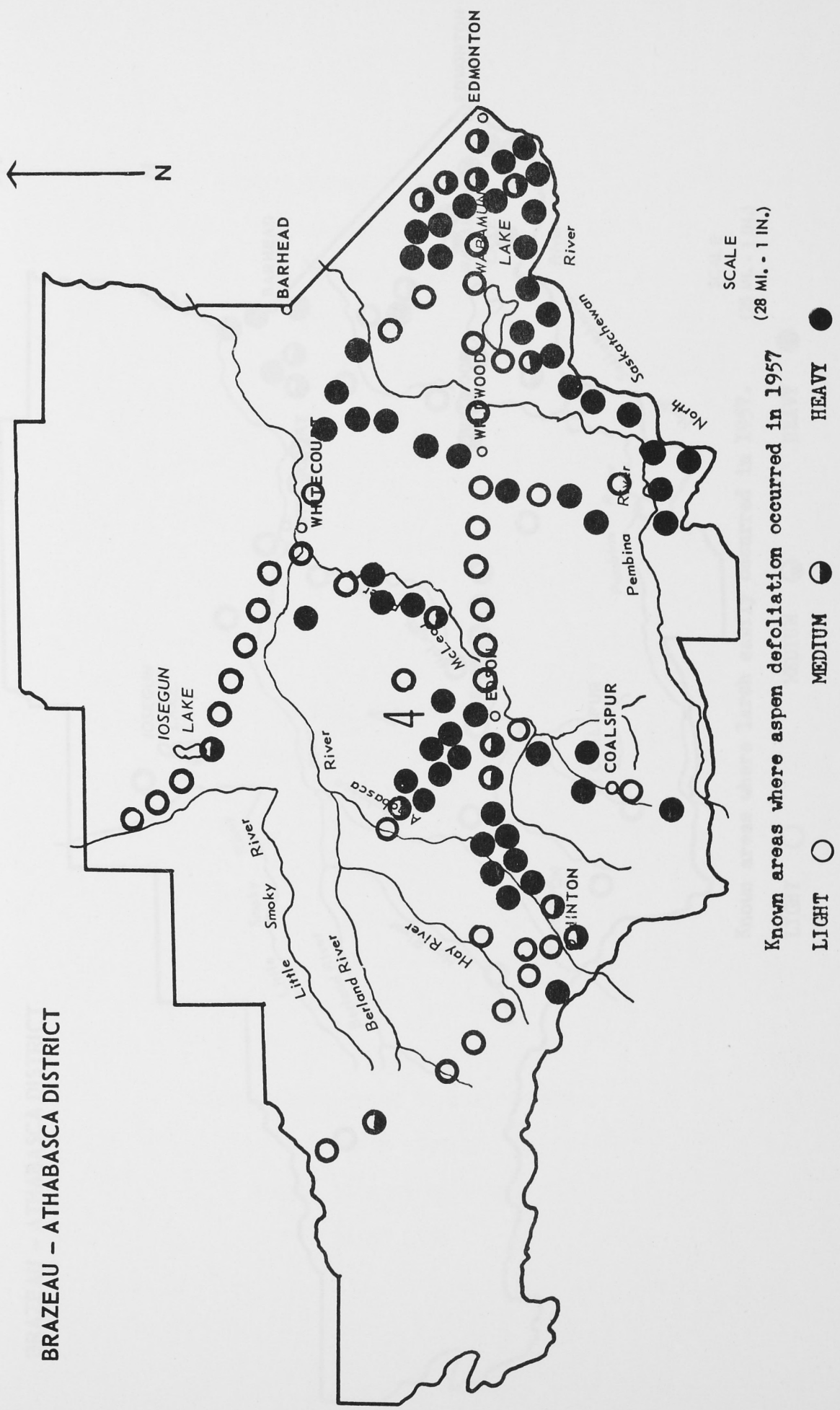
Larvae of this needle-miner were taken from jack pine 3 miles north of Devon and 2 miles south-east of Tomahawk. They were also collected from black spruce at Granada and 2 miles north of Duffield.

BRAZEAU - ATHABASCA DISTRICT



Location of points where collections or field records were taken in 1957.

BRAZEAU - ATHABASCA DISTRICT

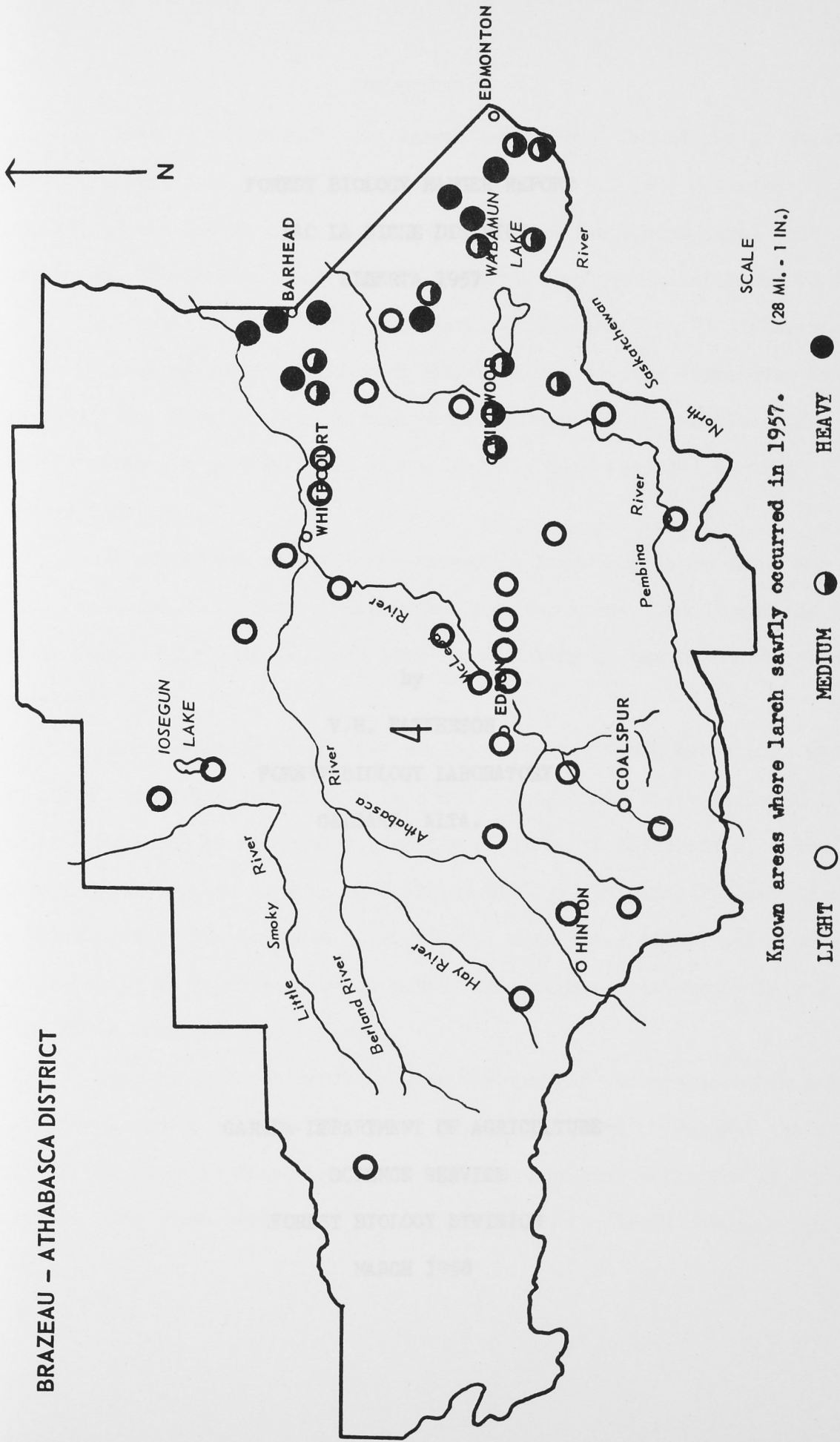


Known areas where aspen defoliation occurred in 1957

LIGHT ○ MEDIUM ◐ HEAVY ●

SCALE
(28 MI. - 1 IN.)

BRAZEAU - ATHABASCA DISTRICT



Known areas where larch sawfly occurred in 1957.

LIGHT ○ MEDIUM ◐ HEAVY ●

FOREST BIOLOGY RANGER REPORT

LAC LA BICHE DISTRICT

ALBERTA 1957

by

V.B. PATTERSON

FOREST BIOLOGY LABORATORY

CALGARY, ALTA.

CANADA DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

FOREST BIOLOGY DIVISION

MARCH 1958

INTRODUCTION

This report covers tree insect and disease conditions as determined by field surveys in Forest Biology Ranger District 5. This district is comprised of the Lac la Biche Forest Division and the agricultural area south to the Battle River and east from Edmonton to the Saskatchewan border.

A total of 369 insect samples was submitted from 23 different hosts.

General survey field work commenced May 13, and terminated September 4 in 1957. The first 3 days of this period were spent in the Slave Lake Forest Division, a part of which had originally been assigned to this ranger's territory.

A survey was made from Waterways to Lower Hay River along the Athabasca, Peace and Slave Rivers during the last two weeks in June and the first week in July. This trip was made with J. K. Robins on the outboard cruiser "Borealis".

Approximately four weeks during September and October were spent with other Forest Biology Rangers on special projects. These included 10 days with P. LaRue on sequential sampling of larch in districts 2, 5 and 6; 8 days in October with J. Emond and Forest Biology Assistant J. Laut in the Elk Point area collecting data on the forest tent caterpillar, and a week with J. Petty, N. Wilkinson and J. McNeil on a bark beetle survey in the Castle River area south of Coleman.

Spruce and larch sawflies were responsible for considerable defoliation of conifers. The yellow-headed spruce sawfly was found throughout the area south of the North Saskatchewan River and from Edmonton north for approximately 50 miles. The larch sawfly was found wherever native larch occurred and also

on planted larch in shelterbelts.

Insects responsible for heavy defoliation to broad-leaved trees were Bruce spanworm, the large aspen tortrix, and a leaf-tier Compsolechia niveopulvella Cham.

An infestation of the forest tent caterpillar is evidently building up along the eastern side of the district as far north as Elk Point.

The co-operation of the Alberta Forest Service, the District Agriculture Service, the Crop Protection and Pest Control Branch, and Edmonton City Parks Department was greatly appreciated.

TABLE 1

Insect Collections
by Host Trees

Coniferous Hosts.	No. Coll.	Deciduous Hosts.	No. Coll.
Spruce	91	Trembling aspen	141
Larch	41	Willow	22
Pine	12	Poplar	20
Balsam fir	2	Birch	18
	146	Elm	4
		Alder	3
		Manitoba maple	2
			210
.....			
Misc.			13
.....			
		GRAND TOTAL	369

INSECT CONDITIONS

Large aspen tortrix, Choristoneura conflictana (Wlk.).

An infestation of the large aspen tortrix was present in District 5 south of a line through Smoky Lake, St Paul, and Bonnyville. Observations made during the spring and summer indicate that very few, if any, aspen in this area escaped injury. Moderate to heavy defoliation was recorded generally south of the North Saskatchewan River with the exception of an area between the River and Cooking Lake, where there was only light feeding. On the north side of the River, injury was heavy in patches around St Paul and Elk Point. Low larval counts were made west from St. Paul to Redwater and also near Athabasca. The highest population counts were made at Elk Point, Vegreville, New Sarepta, Nisku, Calmar, Musidora, Lafond, Viking, Phillips, Wainwright and Hardisty.

Three other leaf feeders of aspen were present along with the large aspen tortrix and were responsible for a considerable percentage of overall defoliation.

Larvae were present from mid-May until mid-June. First pupation was recorded at the end of May and the first adults appeared about June 10th.

A leaf-tier, Compsiolechia niveopulvella Cham.

Samples of this leaf-tier were taken throughout that part of District 5 south of a line approximately through Redwater, Smoky Lake, and Cold Lake, and at Lac la Biche and at a few locations along the Athabasca River north of Waterways. They were found in association with the large aspen tortrix and therefore the injury caused by them was hard to

assess. Larval counts were not high at most check points although at a number of locations, large numbers of conical shaped rolls of leaves indicated heavy injury. This condition was most noticeable in the Elk Point area, south of Cooking Lake as far as Bashaw, and in the Viking-Killam area.

American poplar beetle, Gonioctina americana (Schaeff.).

The American poplar beetle was collected from aspen at 29 locations in widely separated areas. Usually the injury was light and confined to patches on the edge of bluffs. The heaviest injury was recorded in the Frog Lake Indian Reserve north east of Heinsburg, and at Rusylvia, Lafond, Viking, Jarrow and Lac la Biche.

Grey willow leaf beetle, Galerucella decora (Say.).

Adults of the grey willow leaf beetle were recorded at 29 locations in the district, usually on aspen poplar. They were found from the last week in May until the end of August. Moderate injury was recorded in small patches at Waskatinau, St. Paul, Bonnyville, and Forestburgh. At all other points population counts were low. There was no larval feeding recorded on willow.

Forest tent caterpillar, Malacosoma disstria Hbn.

An outbreak of the forest tent caterpillar was found in District 5. Larvae or cocoons were collected at 40 points from Lac la Biche south east to Czar and east of Elk Island Park.

The highest larval counts were made in the Elk Point - St Paul - Two Hills - Derwent area where they were found in colonies during the last week of May. By the end of May the colonies had dispersed, larvae were feeding singly, and visual population estimates could not be made. The

beating method of sampling had to be used from then on and only a few larvae were obtained in each sample. Because of this a true population estimate may not have been obtained in areas checked at this time and was probably higher than the records indicate.

A special project was carried out in October in the Elk Point area with the assistance of Forest Biology Ranger J. Emond and Forest Biology Assistant J. Laut. Study plots were established in five different age groups of aspen. In each plot 16 trees were cut and data collected on height, D.B.H., crown depth and width, branch lengths, number of branches and the number of new shoots over 8 inches in length. These shoots were considered to be possible laying sites. Four of the trees cut from each plot were selected at random and the total number of buds on each tree was tallied. All egg bands were collected, and the position of each on the tree was recorded.

From this information a sampling technique will be established, and it is hoped that a system of predicting the rise and fall of infestations may be evolved.

Bruce spanworm, Operophtera bruceata (Hulst.).

Injury by Bruce spanworm was heavy in numerous bluffs in the Hay Lakes - Camrose - Ohaton area. Aspen poplar and willow were heavily defoliated and some feeding was recorded on balsam poplar. Other small areas where light defoliation occurred were near the towns of Bruderheim, Speddin, Rusylvia and Cold Lake.

Birch skeletonizer, Bucculatrix canadensisella, Chamb.

Birch trees throughout the city of Edmonton were attacked by this skeletonizer. Moderate to heavy injury was recorded along the banks of the north Saskatchewan River. There was also heavy defoliation to scrub birch along a creek approximately 15 miles north of Hayter.

Neodiprion spp. on pine and spruce.

A species of Neodiprion sawfly was found on pine at 7 locations: Bruderheim, Rochester, Nestow, Westlock, Sunnybrook and Wetaskiwin. There was moderate injury to a row of Scotch pine on a farm shelterbelt near Calmar and also to native pine near Westlock. Elsewhere injury was light.

Another species of Neodiprion sawfly was found on white spruce at 8 locations scattered throughout the area south of the North Saskatchewan River. There was moderate defoliation to shelterbelt trees near Vermilion and Camrose and to native stands in the Menaik-Wetaskiwin area. A few larvae were found near Waterways and near the junction of the Athabasca and Ells Rivers.

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.).

The yellow-headed spruce sawfly was again a major pest to spruce trees in the agricultural area south of the North Saskatchewan River and also in the St. Albert - Morrinville - Westlock area north of Edmonton.

Spruce trees were checked at 58 locations and of these only 2 were completely free of this pest. Heavy injury was recorded on a high percentage of planted spruce within a 75 mile radius of Edmonton. Spraying

by the City Parks Department and the Provincial Crop Protection and Pest Control Branch has considerably reduced the sawfly populations in Edmonton. Some control measures have been taken outside the city but a great many shelterbelts are still heavily infested. Numerous shelterbelts were lightly infested in the area between Vermilion and the Saskatchewan border and also around Hayter and Provost. A trace of injury was also recorded near Venice in the Lac la Biche area. Defoliation was noted on a few shelterbelts east of St. Paul.

Larch sawfly, Pristiphora ericksonii (Htg.).

Larvae of the larch sawfly were present in District 5 from mid-July until the end of the first week of September. Representative samples were taken wherever tamarack occurred in native stands and farm plantations.

There is very little native tamarack growing south of a line running approximately through Barrhead, Westlock, Newbrook and Lac la Biche. Moderate to heavy defoliation occurred this year throughout the area north of this line. Light infestations were recorded between this line and the north Saskatchewan River and Vimy, Speddin and around the south end of Cold Lake. In these areas, tamarack only occurs in low spots on agricultural land.

South of the North Saskatchewan River, larch sawfly was recorded in native stands at Millet and Pigeon Lake and injury was moderate to heavy. Larvae were collected from 6 shelterbelts and defoliation was light to moderate.

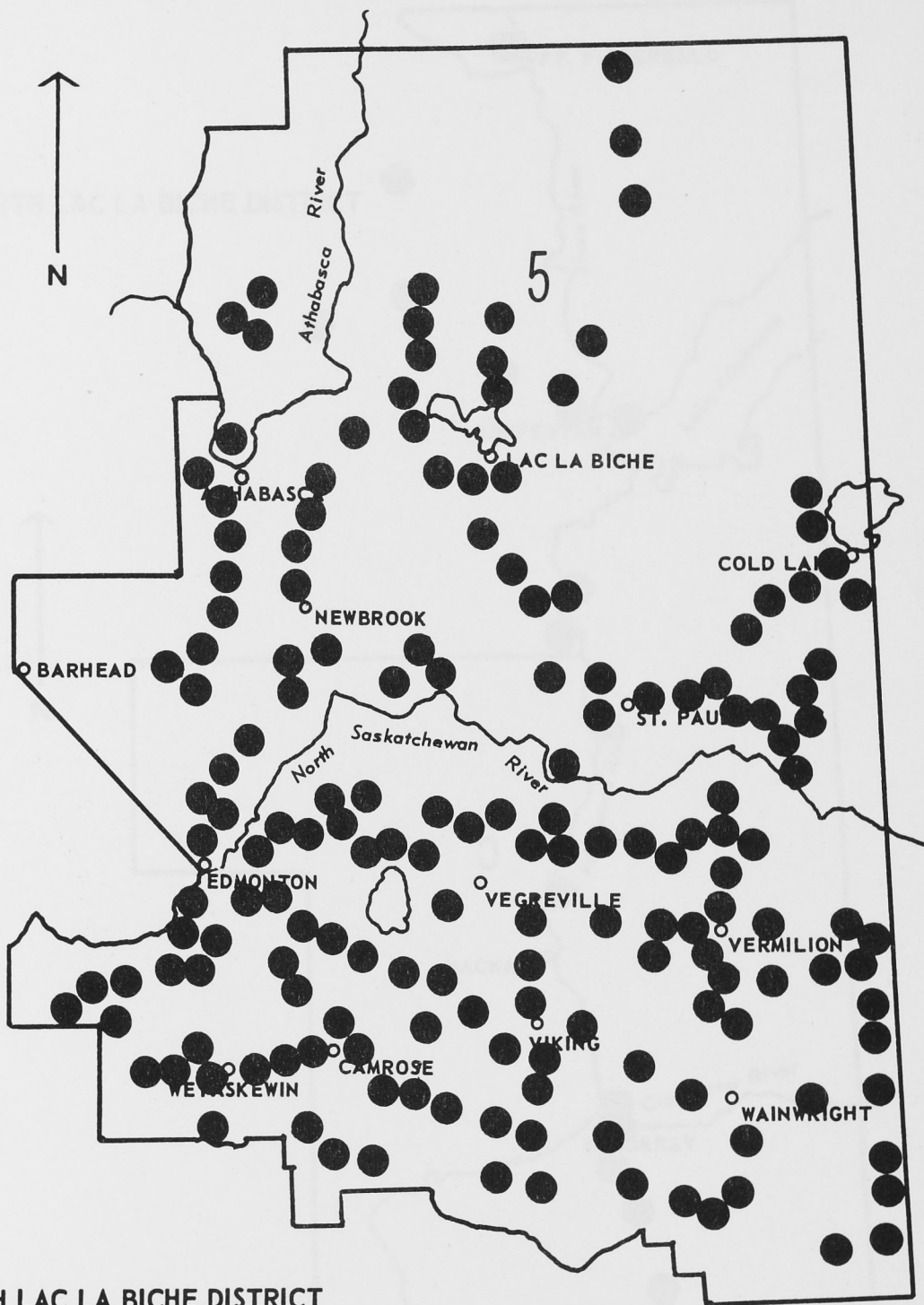
A special survey was made along the Northern Alberta Railway from Lac la Biche to Waterways in co-operation with the Alberta Forest Service. Around the south-eastern tip of Lac la Biche, defoliation was light but from Imperial Mills north, all tamarack was moderately to heavily defoliated.

Permanent study plots are now established at Cold Lake, Spedden, Calling Lake, Perryvale, Lac la Biche and Millet. Sequential sampling was carried out in all of these plots in September.

TABLE II

Results of Sequential Sampling
Larch Sawfly Permanent Sample Plots

Stn. No.	Location	Infestation Class	Cocoons Collected	Cocoons Moused
5 - 01	Calling Lake	Light	208	0
5 - 02	Perryvale	Light	133	0
5 - 03	Millet	Severe	97	6
5 - 04	Grande Centre	Light	77	9
5 - 05	Lac la Biche	Moderate	20	13
5 - 06	Spedden	Moderate	121	14



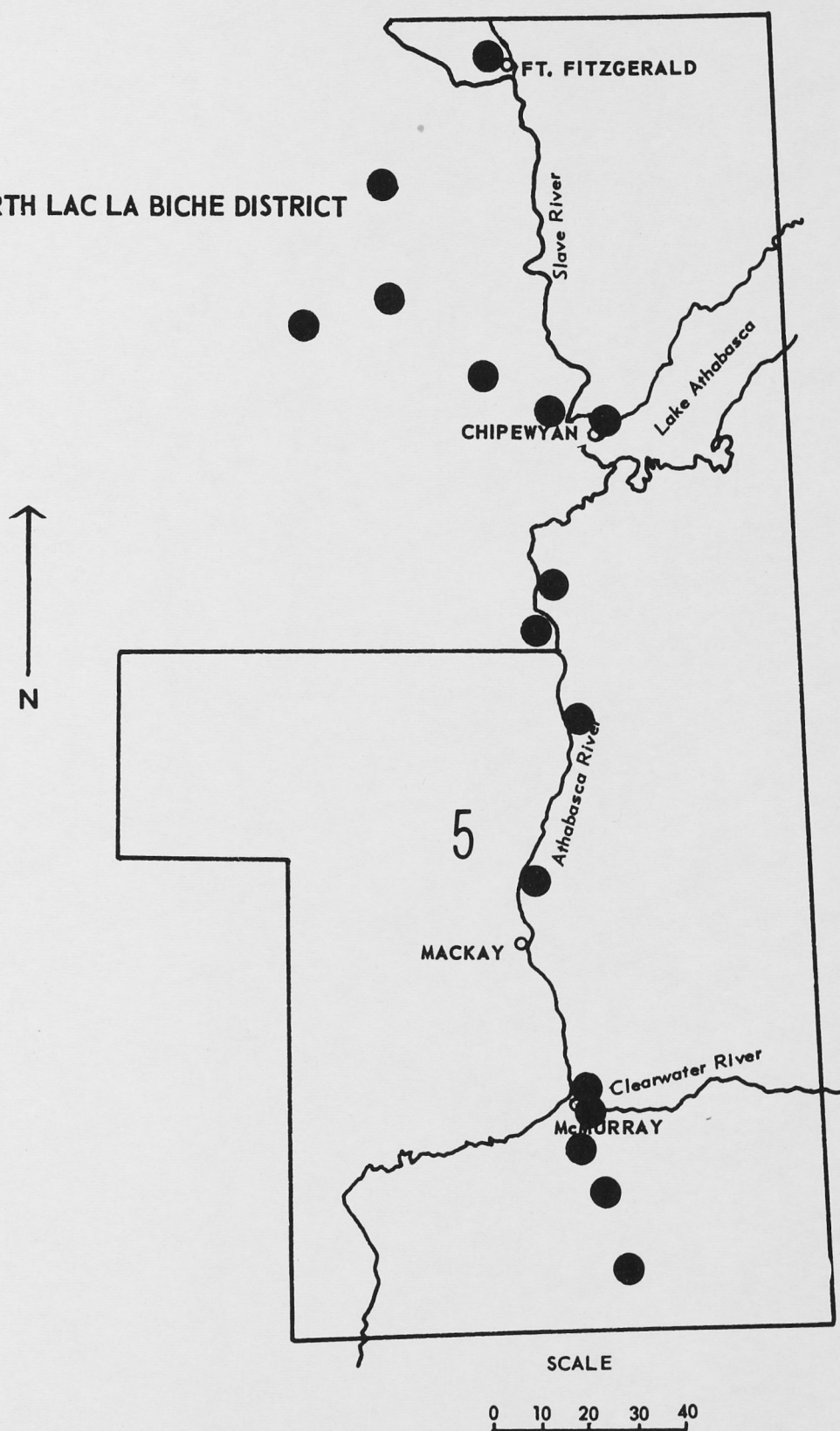
SOUTH LAC LA BICHE DISTRICT

Location of points where collections or field records were taken in 1957

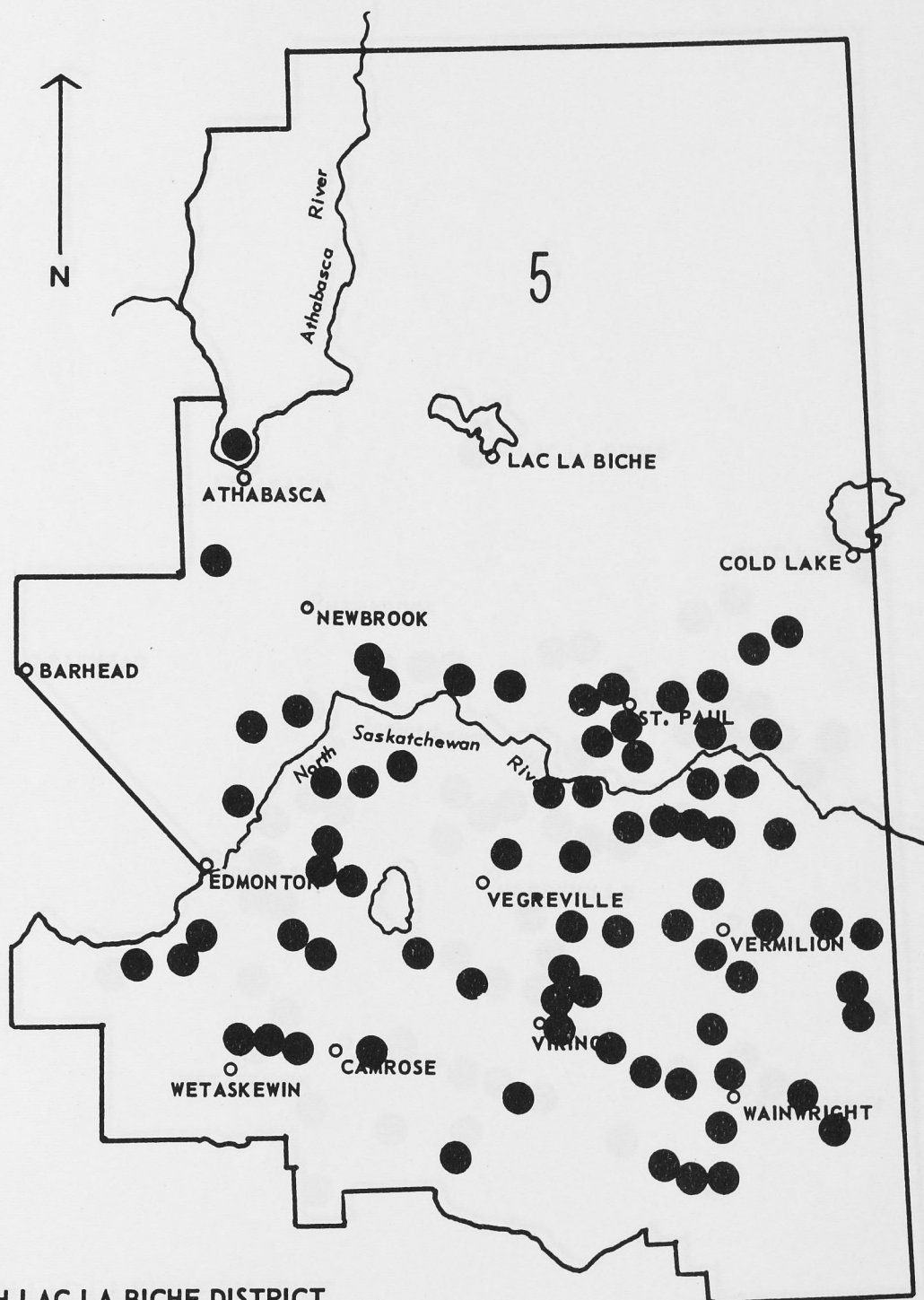
SCALE

0 10 20 30 40

NORTH LAC LA BICHE DISTRICT



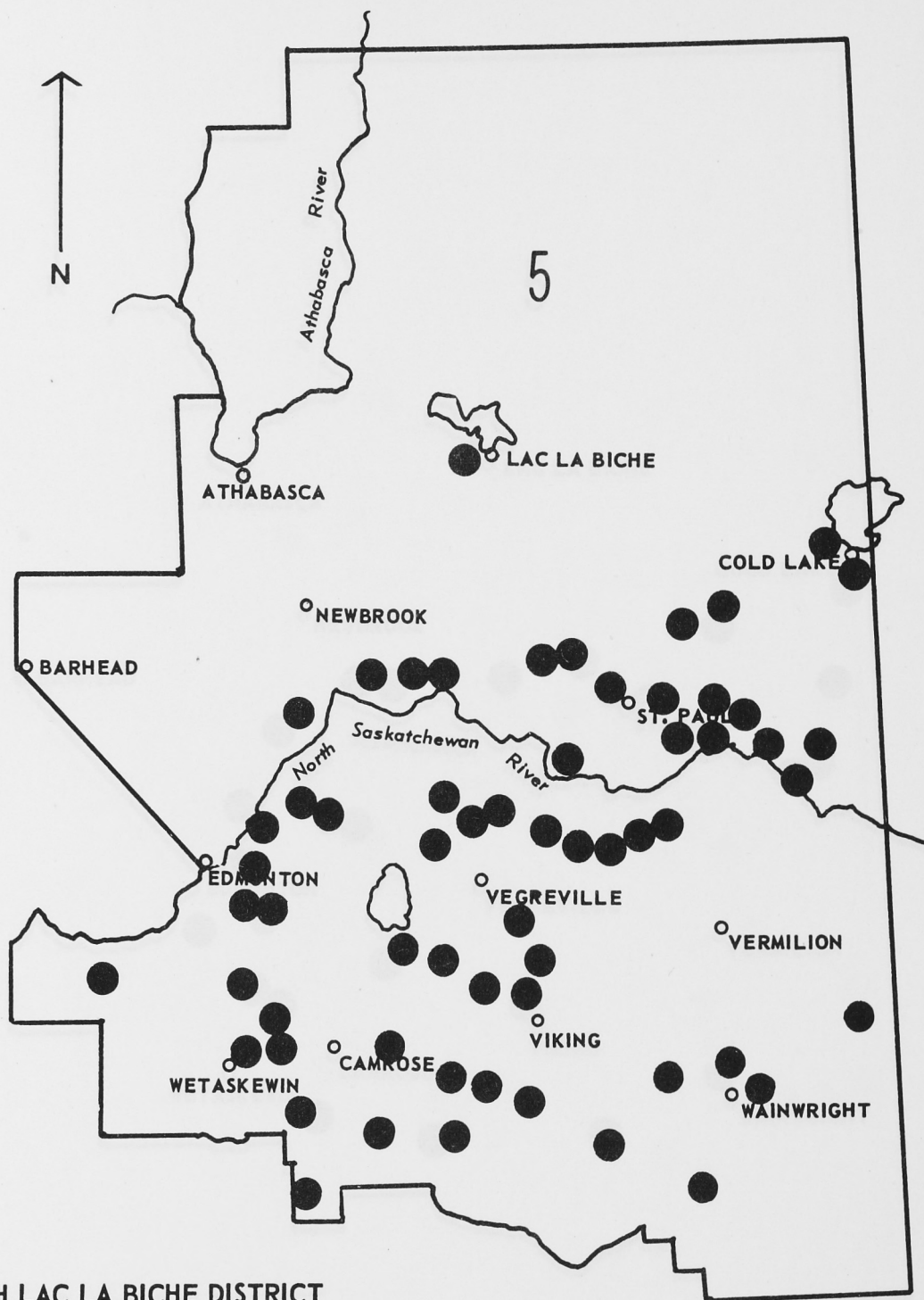
Location of points where collections or field records were taken in 1957.



SOUTH LAC LA BICHE DISTRICT

SCALE
0 10 20 30 40

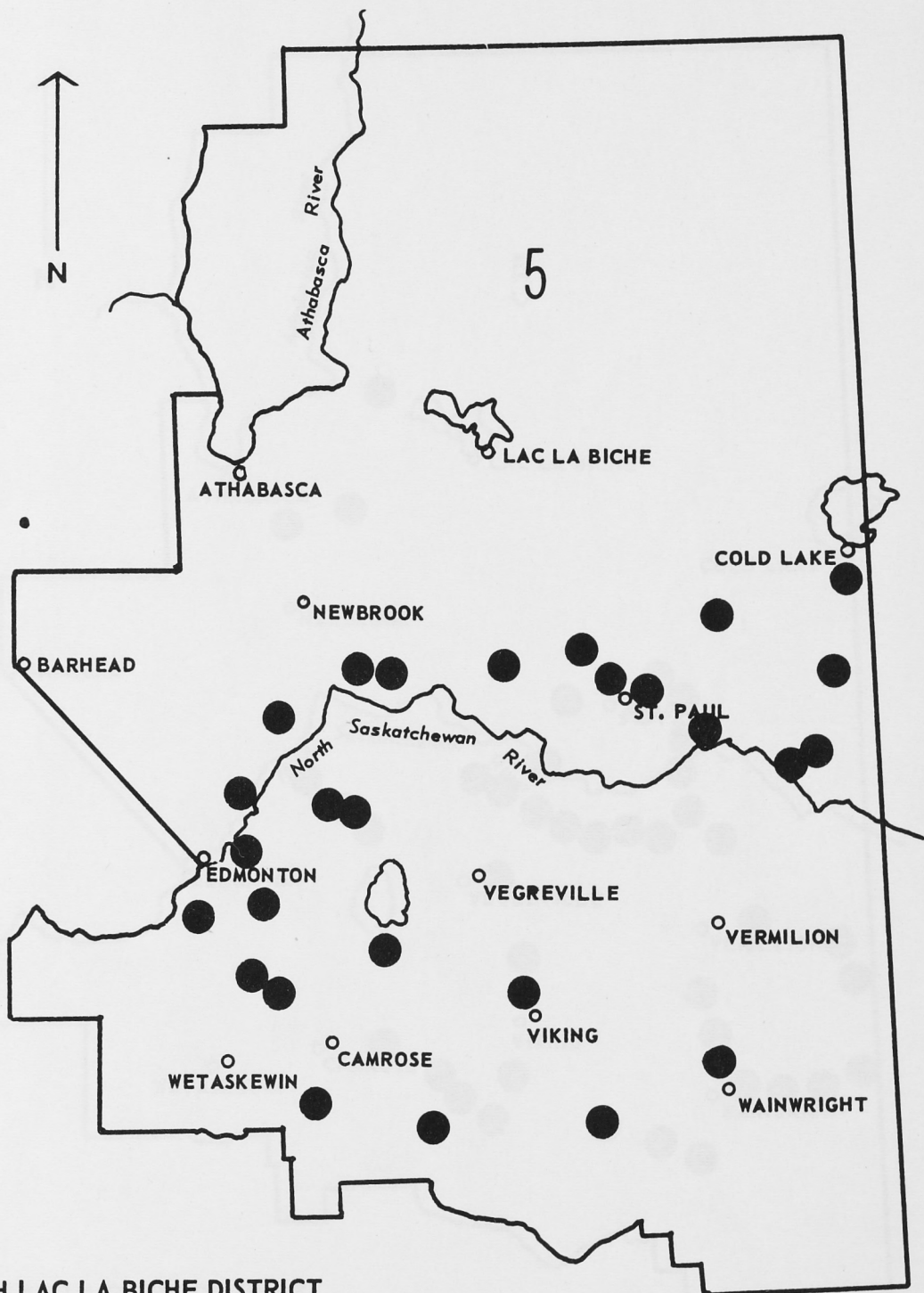
Known areas where the large aspen tortrix occurred in 1957



SOUTH LAC LA BICHE DISTRICT

SCALE
0 10 20 30 40

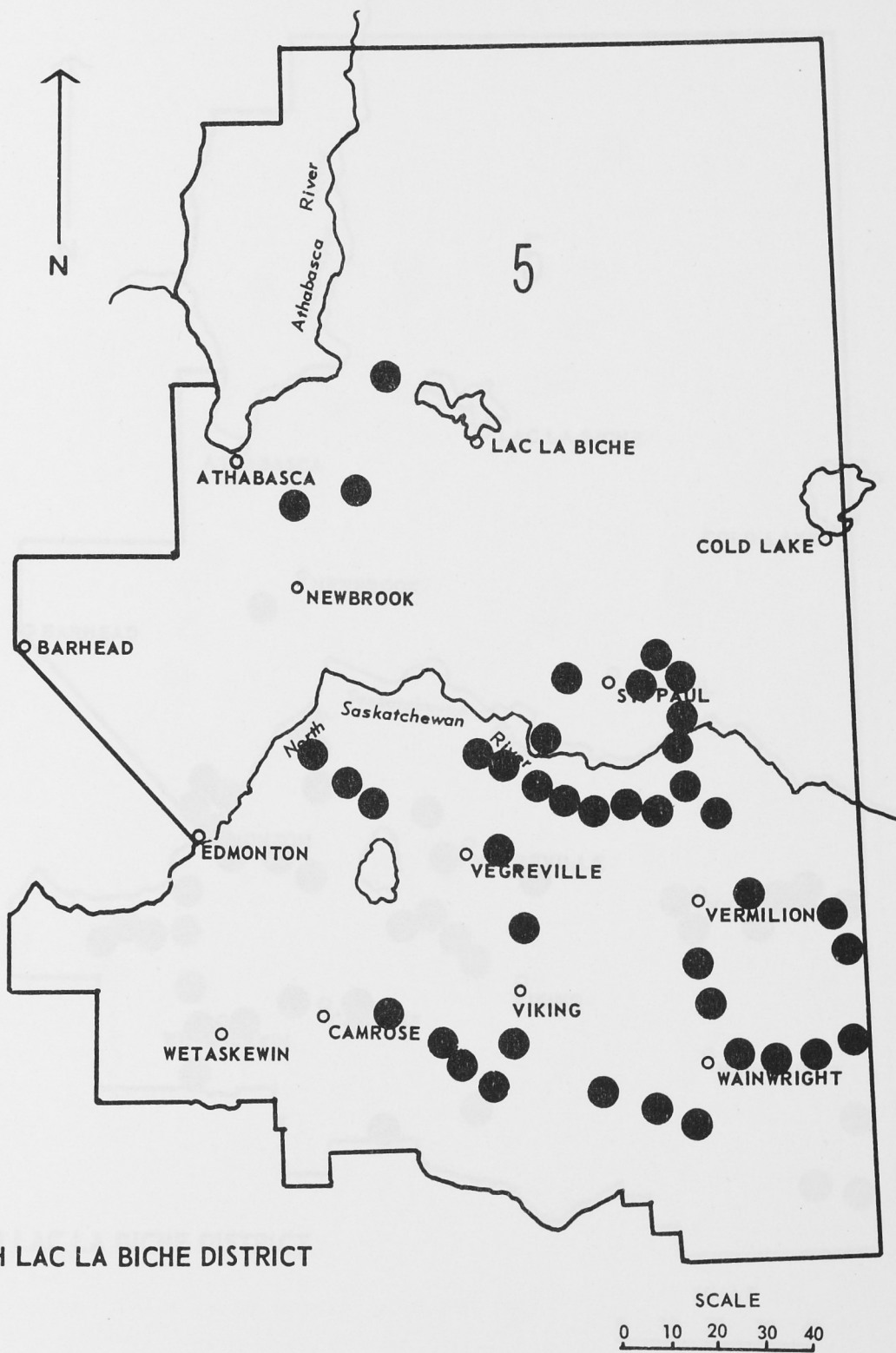
Known areas where *Compsolechia niveopulvella* occurred in 1957



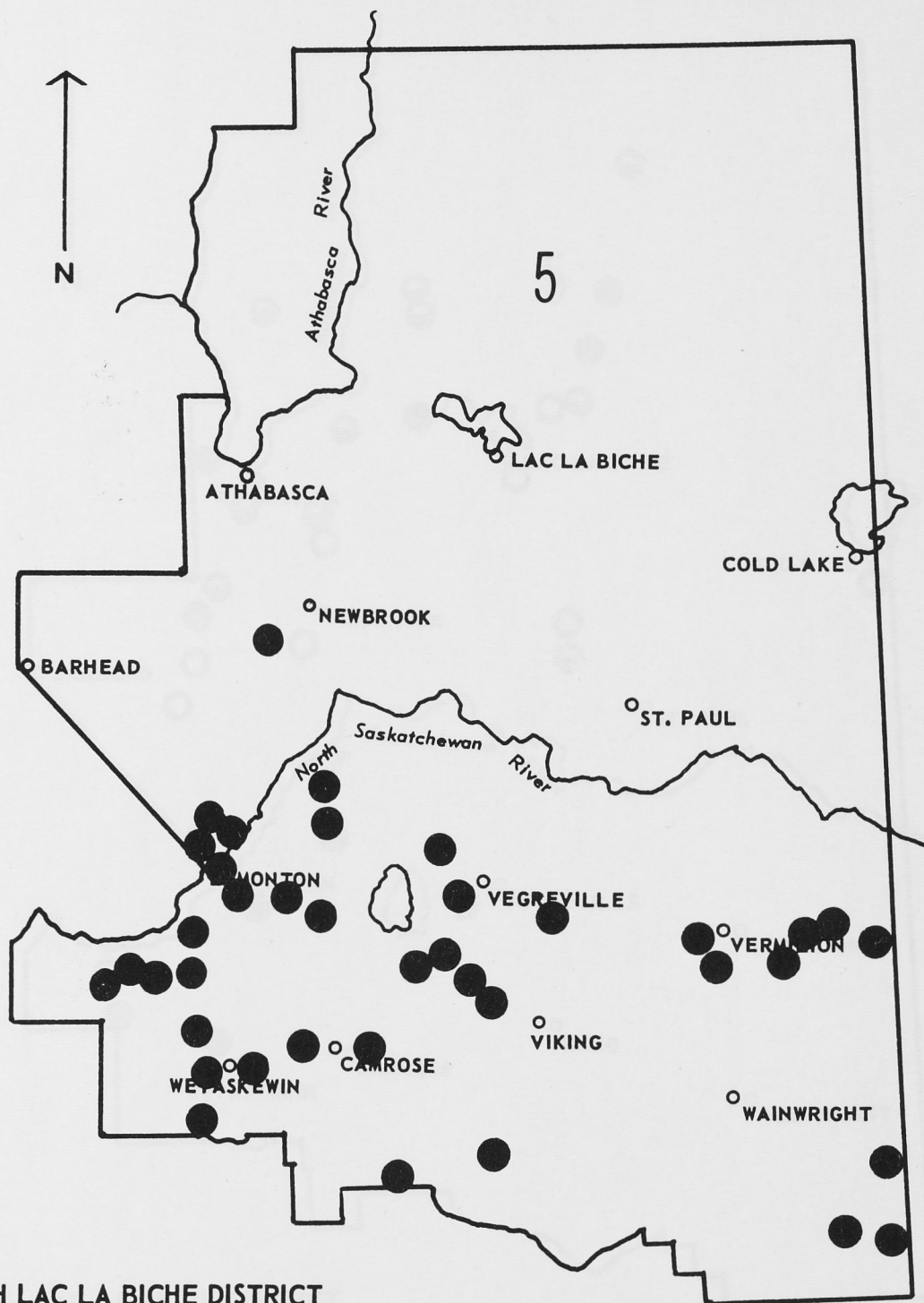
SOUTH LAC LA BICHE DISTRICT

SCALE
0 10 20 30 40

Known areas where the grey willow leaf beetle occurred in 1957



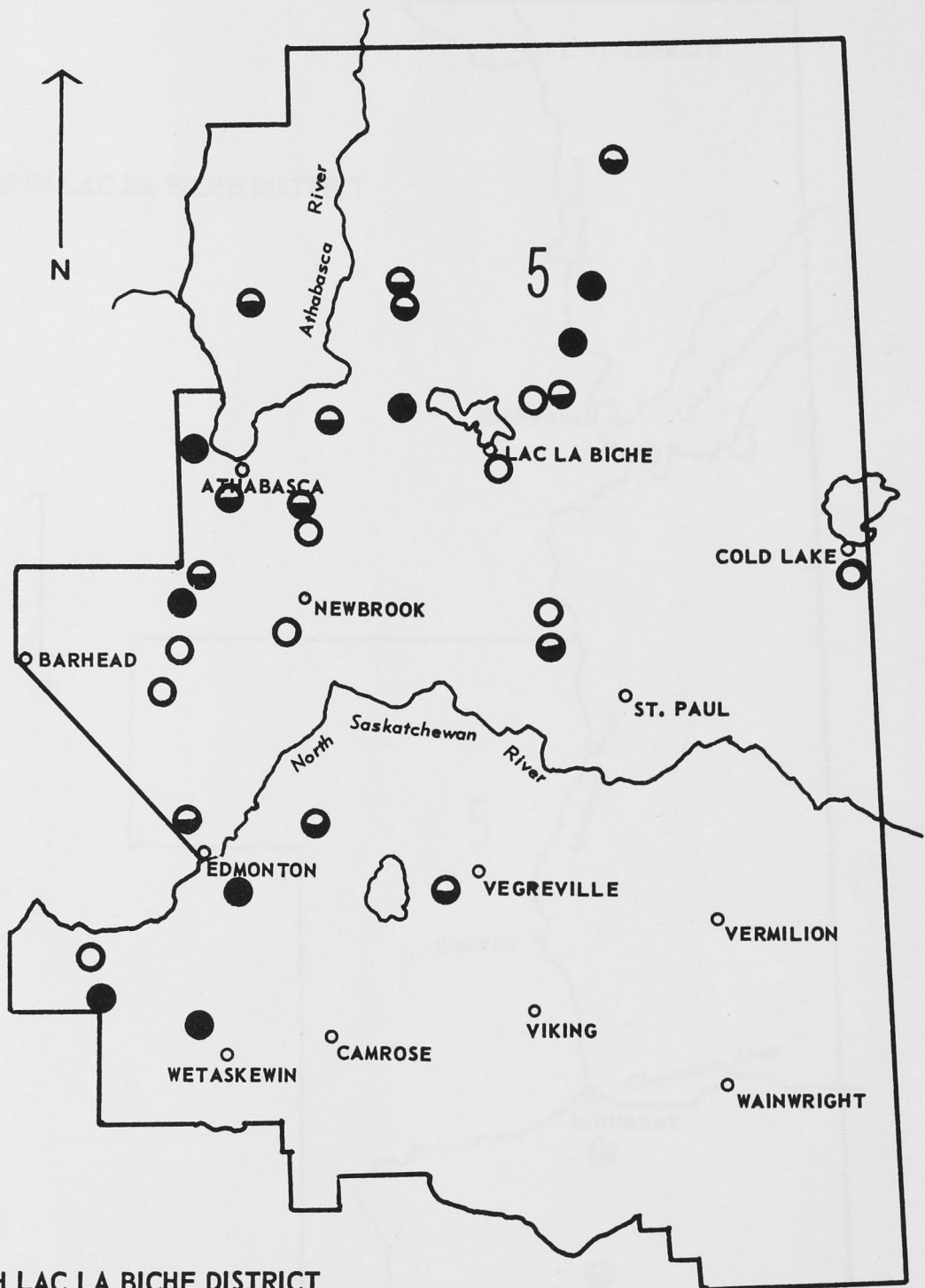
Known areas where the forest tent caterpillar occurred in 1957



SOUTH LAC LA BICHE DISTRICT

SCALE
0 10 20 30 40

Known areas where yellow headed spruce sawfly occurred in 1957



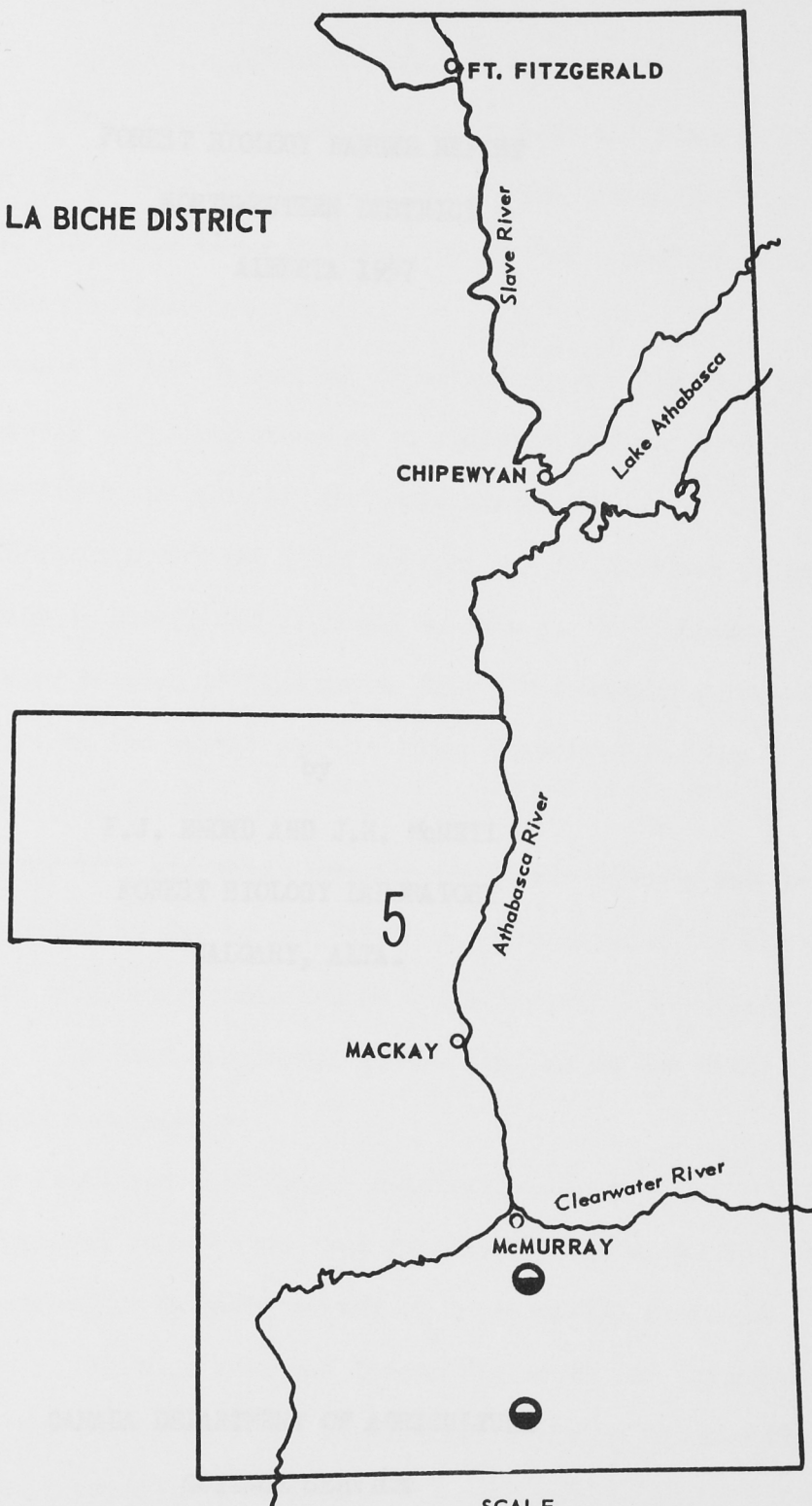
SOUTH LAC LA BICHE DISTRICT

Known areas where larch sawfly occurred in 1957

LIGHT ○ MEDIUM ◐ HEAVY ●

SCALE
0 10 20 30 40

NORTH LAC LA BICHE DISTRICT



SCALE

0 10 20 30 40

Known areas where larch sawfly occurred in 1957

LIGHT ○

MEDIUM ●

HEAVY ●

FOREST BIOLOGY RANGER REPORT

NORTHWESTERN DISTRICT

ALBERTA 1957

by

F.J. EMOND AND J.H. McNEIL

FOREST BIOLOGY LABORATORY

CALGARY, ALTA.

CANADA DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

FOREST BIOLOGY DIVISION

MARCH 1958

INTRODUCTION

The following report covers forest insect and disease survey activities from May 10 to September 3, 1957, in the Grande Prairie District (No.6), the Peace River District (No.7) and a portion of the North West Territories District (No.8).

An unusually wet summer was experienced, greatly restricting travel and adversely affecting coverage in outlying areas. A total of 485 insect collections was made in the three districts.

E. Thornton commenced field work on May 10, and was joined by the new rangers J. McNeil and J. Emond on June 3. E. Thornton returned to Calgary because of illness on June 8 and McNeil and Emond continued to carry on the survey work in these districts for the remainder of the field season.

A survey trip was made along the MacKenzie Highway and into the North West Territories as far as Hay River to coincide with the end of the northern boat trip being conducted by Chief Ranger J. K. Robins and Ranger Patterson. The boat was loaded on the trailer at Hay River and returned to Calgary for repairs.

Ranger Emond assisted Ranger Stanley in District 4 for two weeks in May on general survey work, and for another two weeks in September on a sequential sampling survey of larch sawfly plots in District 4, 6 and 7. He also assisted Ranger Patterson for approximately one month during mid-summer on field surveys and again in October for ten days on a tent caterpillar project.

Ranger McNeil participated in the bark beetle survey in the Castle River area in September.

The most important outbreaks of 1956 were investigated and no major changes were apparent. An outbreak of Bruce spanworm was reported south-west of Grande Prairie and defoliation was heavy in a small area. Evidence of pine root weevil was found in the majority of stands of pine checked throughout the districts.

TABLE I

Insect Collections
by Host

Coniferous Hosts.	No. Coll.	Deciduous Hosts.	No. Coll.
Spruce	79	Trembling aspen	164
Jack pine	31	Poplar	70
Eastern larch	28	Willow	54
Lodgepole pine	7	Birch	28
	<u>145</u>		<u>316</u>
.....			
Misc.			24
.....			
		GRAND TOTAL	485

INSECT CONDITIONS

A pine root weevil, Hylobius sp.

Sampling was carried out in all lodgepole and jack pine stands encountered in the area. Evidence of this insect was found in varying degrees of intensity in all stands checked. Girdling of small trees was noted south of Grande Prairie.

American poplar beetle, Gonioctena americana (Schaeff.).

This insect was found on aspen poplar around the southern shore of Lesser Slave Lake in what was considered low numbers.

Birch leaf skeletonizer, Bucculatrix canadensisella Chamb.

Light populations of this insect were present on white birch throughout District 6. In the area bordering the shore of Lesser Slave Lake and extending south to Fawcett, populations were slightly higher than in other areas. Damage caused by this species was light.

Large aspen tortrix, Choristoneura conflictana (Wlk.).

The infestation of this leaf roller on aspen poplar in the Fort Vermilion area virtually disappeared in 1957 and only light defoliation in scattered areas was observed.

Aphidae.

A special effort was made to collect these insects in various stages of development. Colonies of different species were numerous in all districts.

Bruce spanworm, Operophtera bruceata (Hulst.).

A small outbreak of these insects was found approximately 40 miles south-west of Grande Prairie and defoliation was heavy in a small area. Elsewhere throughout the districts the populations of this insect were low.

Black headed budworm, Accleris variana (Fern.).

Population levels of this species were light during the 1957 field season. They were found only in the area around Kathleen and at a point 20 miles south of Hay River, N.W.T.

Forest tent caterpillar, Malacosoma disstria Hbn.

A few larvae of this species were found near the town of Slave Lake, at Spirit River and at a point south of Manning. No evidence of forest tent caterpillar was found at mile 103 on the Mac Kenzie Highway where an outbreak was reported in 1956.

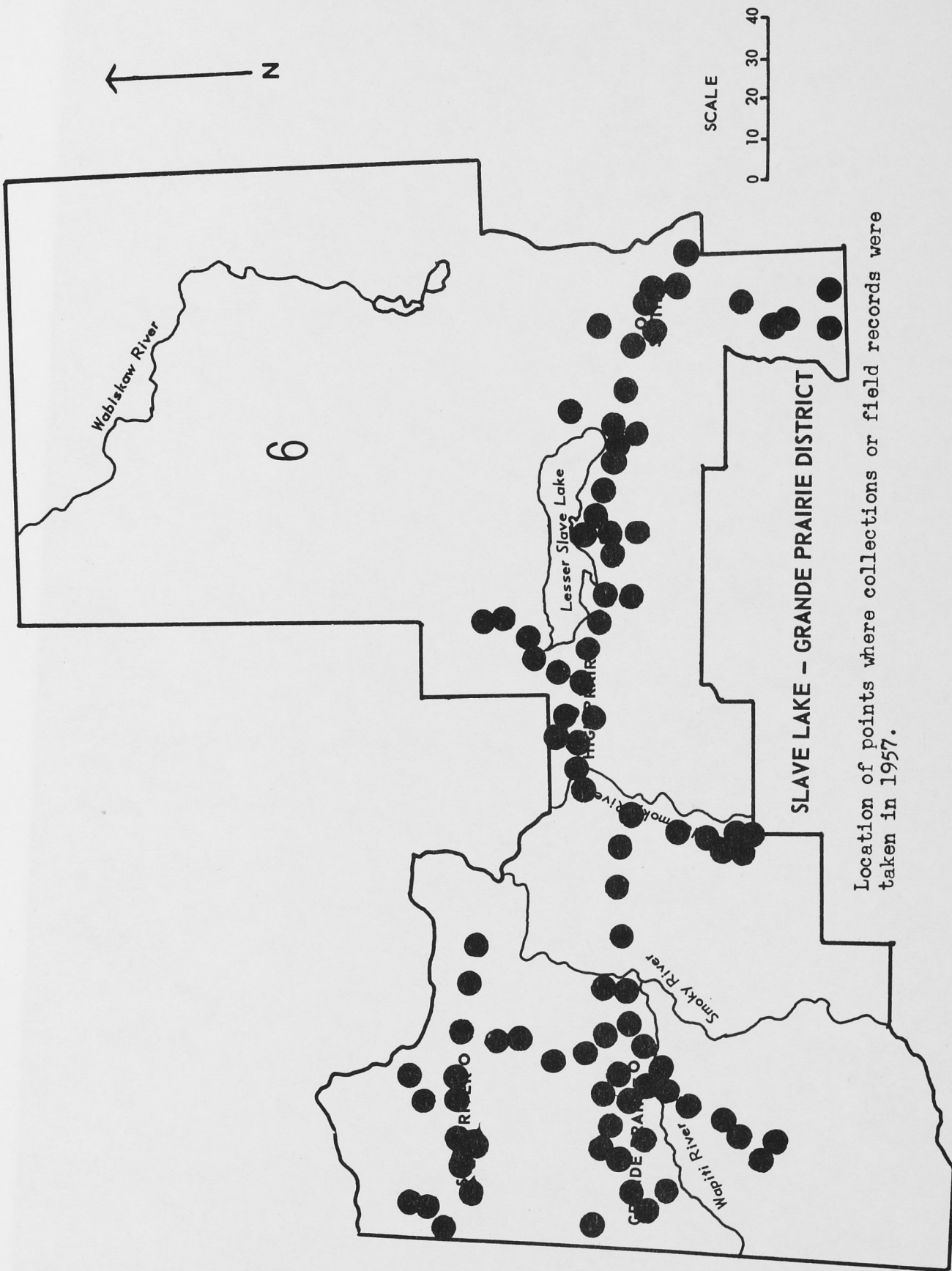
Larch sawfly. Pristiphora erichsonii (Htg.).

Distribution of this species was much the same in 1957 as it was in 1956. Larvae were found in nearly all stands of tamarack as far north as High Level. Damage caused by this insect was light except in the area around the town of Slave Lake and extending south to Fawcett where defoliation was medium.

TABLE 2

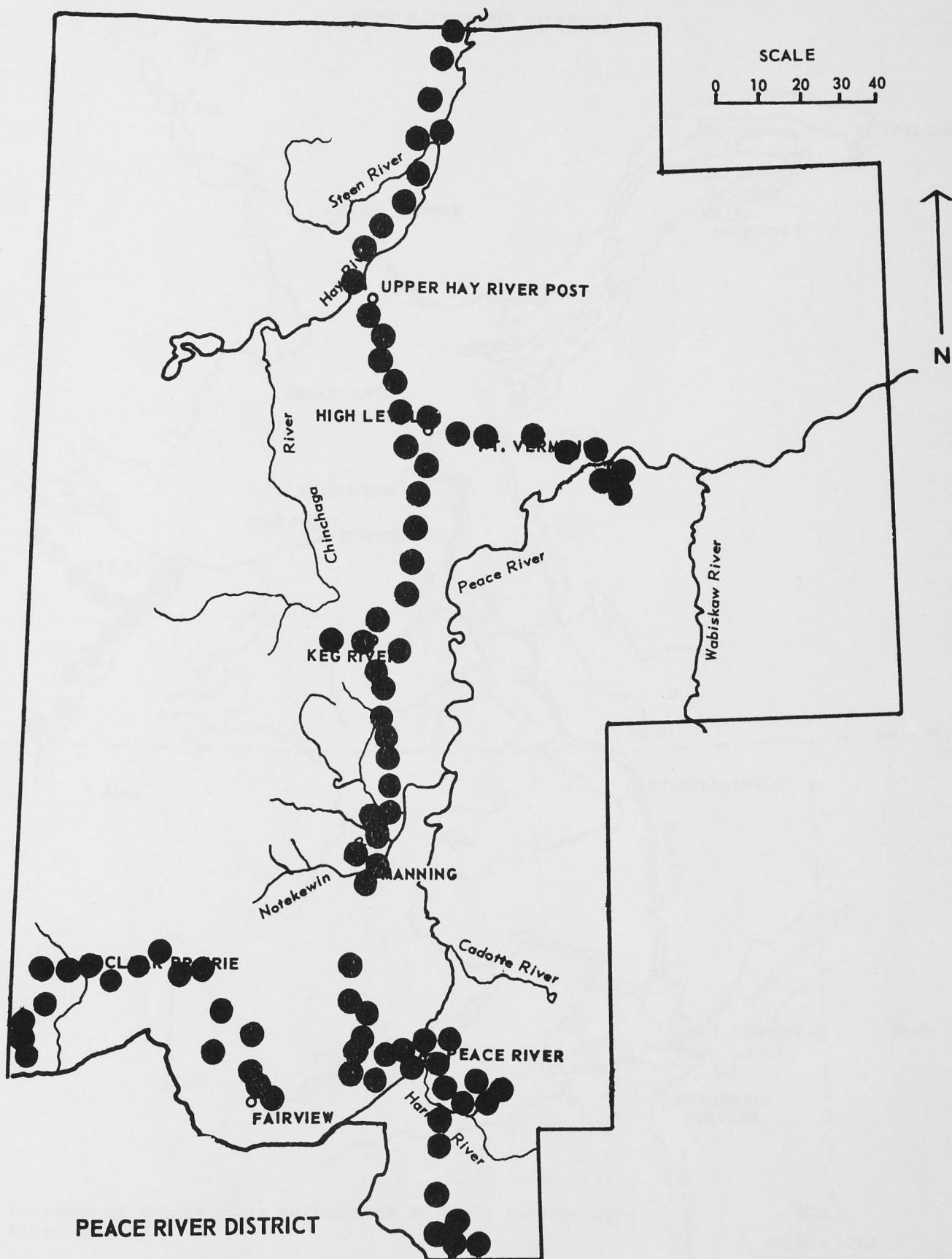
Results of Sequential Sampling
Larch Sawfly Permanent Sample Plots.

Stn. No.	Location	Infestation Class	Cocoons Collected	Cocoons Moused
6 - 1	Grande Prairie	Light	Nil	Nil
6 - 2	Watino	Light	Nil	Nil
6 - 3	Flatbush	Medium	211	4
6 - 4	Slave Lake	Light	7	Nil
6 - 5	Grouard	Light	Nil	Nil
7 - 1	Grimshaw	Light	Nil	Nil
7 - 2	Keg River	Light	Nil	Nil
7 - 3	High Level	Light	Nil	Nil



SLAVE LAKE - GRANDE PRAIRIE DISTRICT

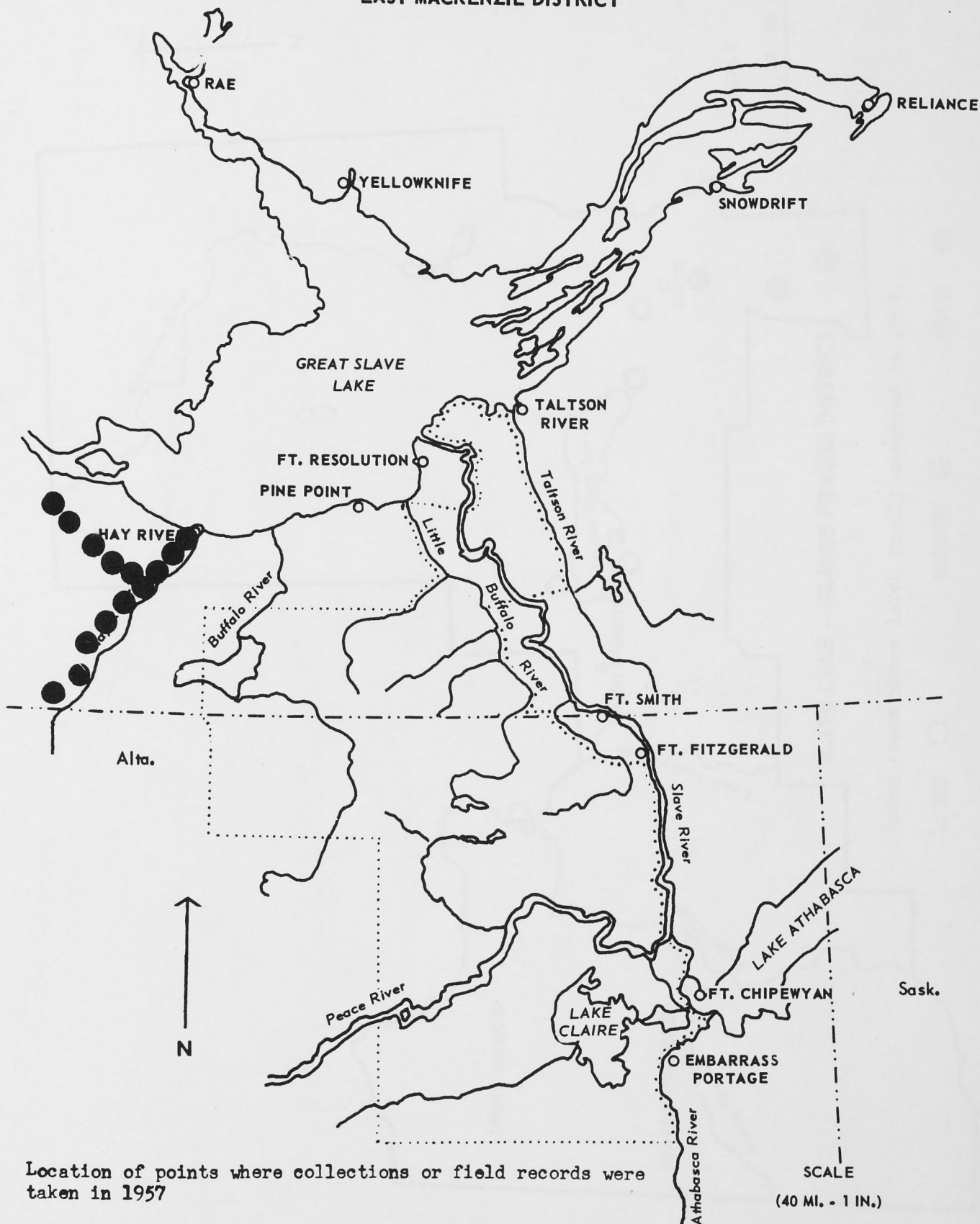
Location of points where collections or field records were taken in 1957.



PEACE RIVER DISTRICT

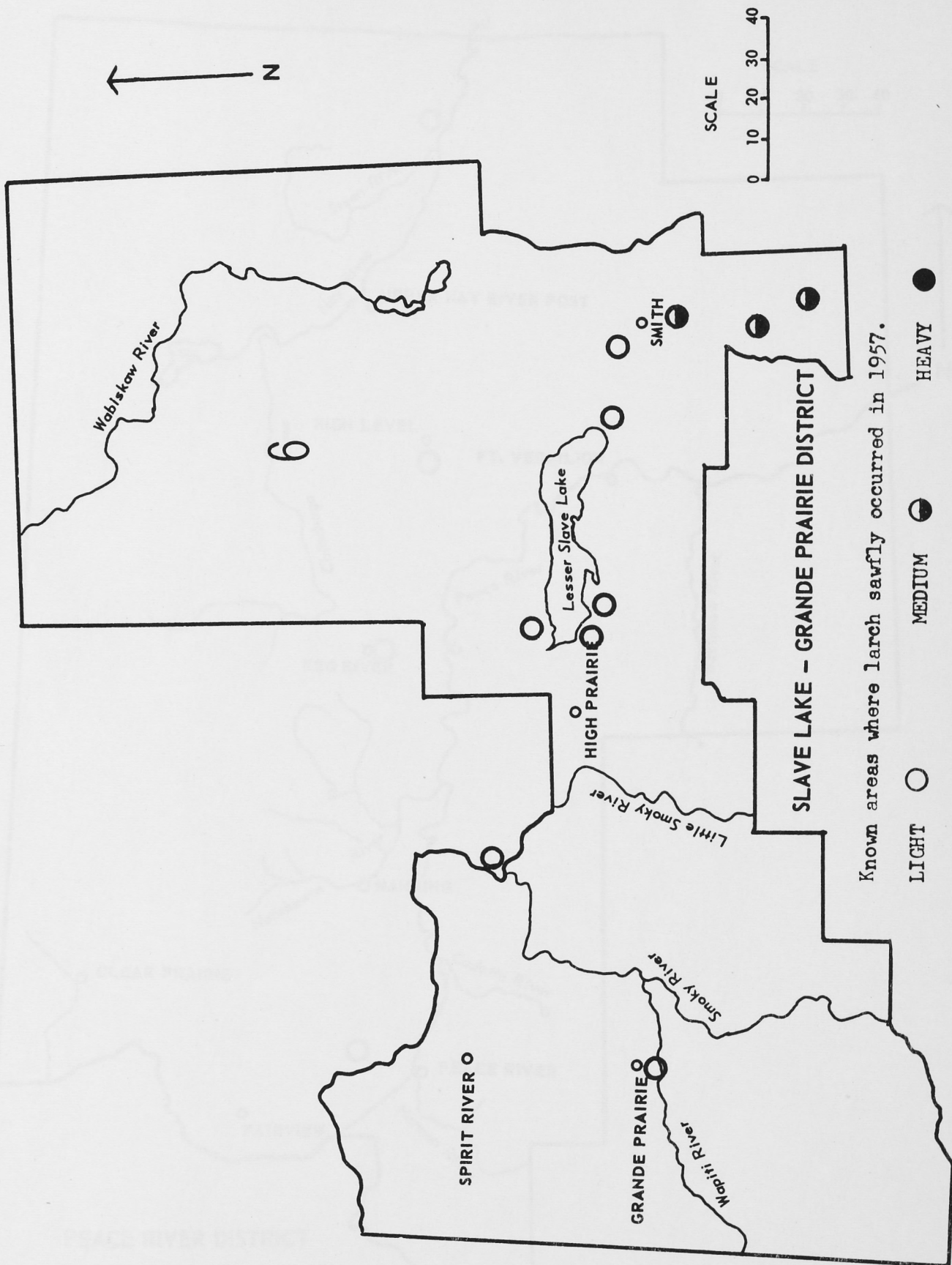
Location of points where collections or field records were taken in 1957

EAST MACKENZIE DISTRICT

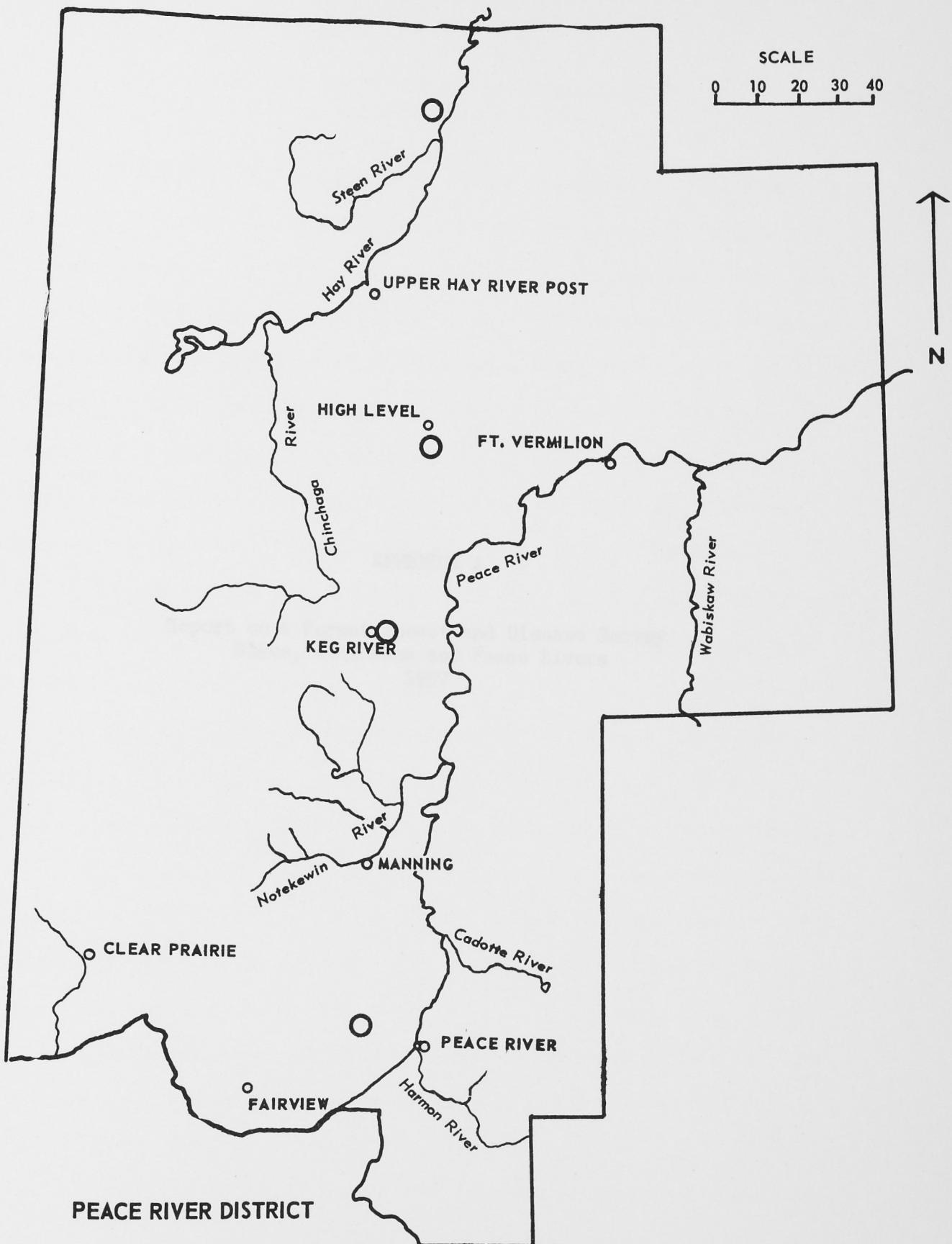


Location of points where collections or field records were taken in 1957

SCALE
(40 MI. = 1 IN.)



Known areas where larch sawfly occurred in 1957.



Known areas where larch sawfly occurred in 1957.

LIGHT ○

MEDIUM ◐

HEAVY ●

REPORT ON A FOREST INSECT AND DISEASE SURVEY
SLAVE, ATHABASCA AND PEACE RIVERS.

On June 22, Forest Biology Ranger Supervisor J. Robins and
Ranger V. Patterson left Ft. McMurray to conduct a general insect and
disease survey of the timber stands adjacent to the Athabasca and Slave
Rivers and the lower end of the Peace River. The survey boat "Porcupine"
was used as transportation. The route taken was from Ft. McMurray on the
Clearwater River, down the Athabasca River to Lake Athabasca, across the
lake to Ft. Chipewyan and through the Chena and Quatre Fourches to
Rocky Point. From here a short trip was made up the Peace, down the
Slave River to Great Slave Lake and the lake to Hay River.

APPENDIX A

Report on a Forest Insect and Disease Survey
Slave, Athabasca and Peace Rivers
1957

The trip was completed in 17 days, including a two day wait at
Ft. Smith before the boat could be transported from Ft. Chipewyan, and a
two day layover at the delta of the Slave River during a wildfire.

A two hour aerial survey was made over a large area of the Wood
Buffalo National Park south of Ft. Smith to Kiam Lake and west to Buffalo
River. This survey was made by helicopter through the cooperation of the
Department of Northern Affairs.

Numerous stands of timber were inspected with sight glasses
from an elevation of 500 feet but no defoliation or other signs caused by the
larch sawfly could be detected.

There was little insect activity of any importance other than
that of the spruce barkworm. Other insects worthy of mention were a leaf-

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SLAVE, ATHABASCA AND PEACE RIVERS.

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The trip was completed in 17 days, including a two day wait at Ft. Smith before the boat could be transported from Ft. Fitzgerald, and a two day layover at the delta of the Slave River during a wind-storm.

A two hour aerial survey was made over a large area of the Wood Buffalo National Park south of Ft. Smith to Pine Lake and west to Buffalo River. This survey was made by helicopter through the co-operation of the Department of Northern Affairs.

Numerous stands of tamarack were inspected with field glasses from an elevation of 500 feet but no defoliation or curled tips caused by the larch sawfly could be detected.

There was little insect activity of any importance other than that of the spruce budworm. Other insects worthy of mention were a leaf-

tier, Compsolechia niveopulvella Cham., the black-headed budworm, leaf beetles and wood borers of poplar.

Spruce budworm, Choristoneura fumiferana (Clem.).

Larvae of the spruce budworm were collected from white spruce at five locations north of Lake Athabasca. Light injury was recorded in Wood Buffalo National Park near the junction of the Peace and Jack Fish rivers and at Pine Lake. In the North West Territories, the infestation which was reported in 1956, was still present. Larvae were found on white spruce along the Slave River from Brule Point to the junction of the Slave and Jean rivers. Larval counts were generally low and very little injury was noted, with the exception of an area in the vicinity of the Resdelta Lumber Camp. At a point near the camp site, 191 larvae were recovered from a 15 foot white spruce. Rearing records of larvae submitted from this area, indicate that parasites will have little immediate effect on controlling the outbreak.

Black-headed budworm, Acleris variana Fern.

A few larvae of the black-headed budworm were found at almost all points where white spruce was inspected from Waterways, Alta., to Ft. Smith, N.W.T. Injury was light at all locations.

A leaf-tier, Compsolechia niveopulvella Cham.

This leaf tier was recorded generally on trembling aspen along the river banks from Waterways to Ft. Fitzgerald. Larval counts were low and injury was very light.

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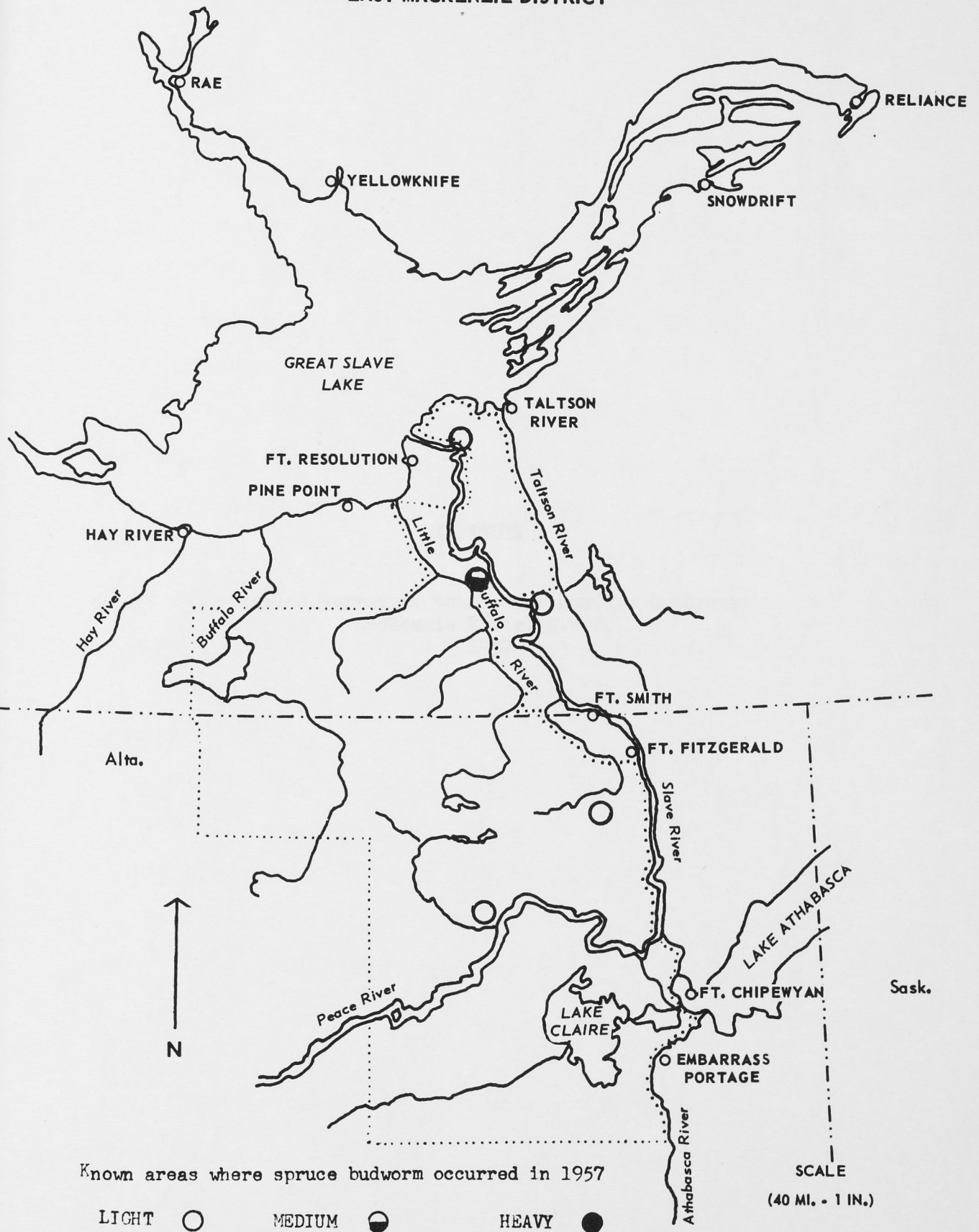
Leaf beetles on aspen poplar.

The American poplar beetle, Gonioctena americana (Schaeff.). was found at two locations: Waterways and Ft. Chipewyan. They were in the larval stage and both infestations were light. Adults of the grey-willow leaf beetle, Galerucella decora (Say). were collected at Ft. Chipewyan in small numbers and injury was very light.

A wood borer on balsam poplar.

An undetermined species of wood borer caused heavy injury to balsam poplar along the Peace River at a point approximately 1 mile upstream from Swanson Lumber Mill # 3. For a distance of 2 miles along the east bank of the river there was a high percentage of dead tops on mature trees.

EAST MACKENZIE DISTRICT



AERIAL SURVEY OF THE SPRUCE BUDWORM OUTBREAK MACKENZIE RIVER, N.W.T.

1957

An aerial survey of the spruce budworm infestation in the Upper Mackenzie River Region was carried out by G. E. Hopping, Officer-in-Charge of the Forest Biology Laboratory in Calgary and E. J. Benoit, Officer-in-Charge of the Forest Disease Survey, between July 15 and 21, 1957. A twin-engine aircraft based at Hay River was chartered from Pacific Western Airlines for the survey.

The original flight plan called for coverage of the Mackenzie River below the British Columbia boundary, the Mackenzie River above Fort Reliance, the Bear River and the lower portions of the largest tributaries of the Mackenzie including the North Saskatchewan and the Peace. An unserviceable aircraft and poor visibility limited the

APPENDIX B

Aerial Survey of the Spruce Budworm Outbreak Mackenzie River, N.W.T.

1957

Three infestation categories were used in mapping spruce budworm areas:

- Light - Tops of the spruce heavily discoloured giving the stand as a whole a pale reddish-yellow tinge.
- Medium - Tops of spruce sufficiently discoloured to give the stand a distinct reddish-yellow tinge, but the tops obviously more discoloured than the remainder of the crown.
- Heavy - The stand with a more or less uniform, rather dark reddish tinge.

The infestation first became apparent from the air, 6 miles below Fort Reliance on the Mackenzie River. From this point northward patches and fairly large areas of infested timber occurred to a point 10 miles north

AERIAL SURVEY OF THE SPRUCE BUDWORM OUTBREAK
MACKENZIE RIVER, N.W.T.

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The original flight plan called for coverage of the Liard River below the British Columbia Boundary, the MacKenzie River above Norman Wells, the Bear River and the lower portions of the larger tributaries of the MacKenzie including the North Nahanni and the Keele. An unserviceable aircraft and poor visibility caused by smoke from forest fires in Alaska, limited the survey to the MacKenzie River and a portion of the North Nahanni.

Three infestation categories were used in mapping spruce budworm areas:

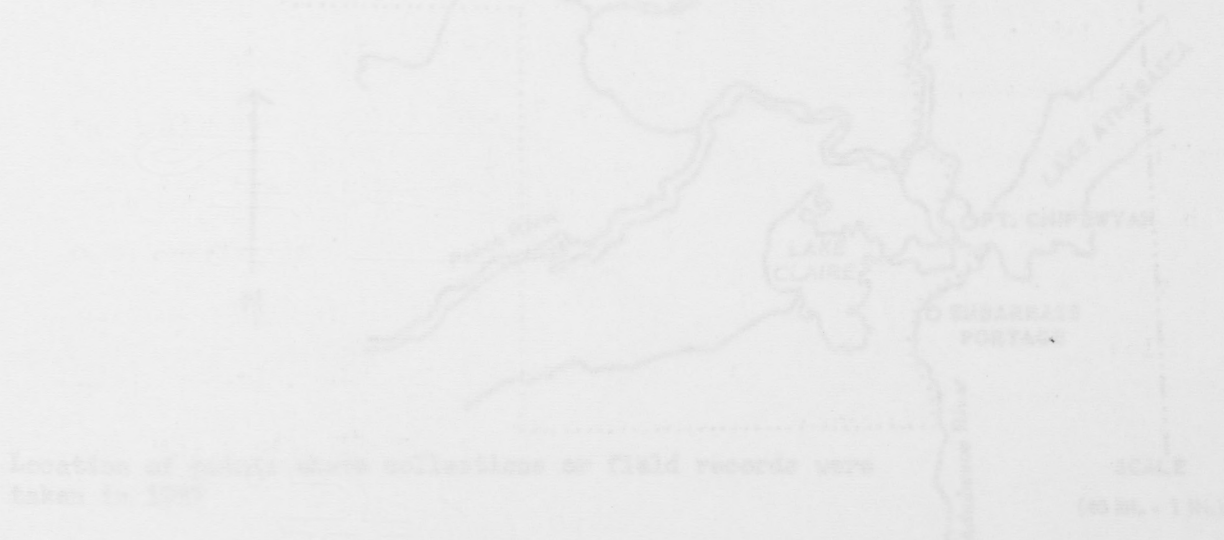
- Light - Tops of the spruce feebly discoloured giving the stand as a whole a pale reddish-yellow tinge.
- Medium - Tops of spruce sufficiently reddened to give the stand a distinct reddish-yellow tinge, but the tops obviously more discoloured than the remainder of the crown.
- Heavy - The stand with a more or less uniform, rather dark reddish tinge.

The infestation first became apparent from the air, 6 miles below Fort Simpson on the Mackenzie River. From this point north-westward patches and fairly large areas of infested timber occurred to a point 10 miles south

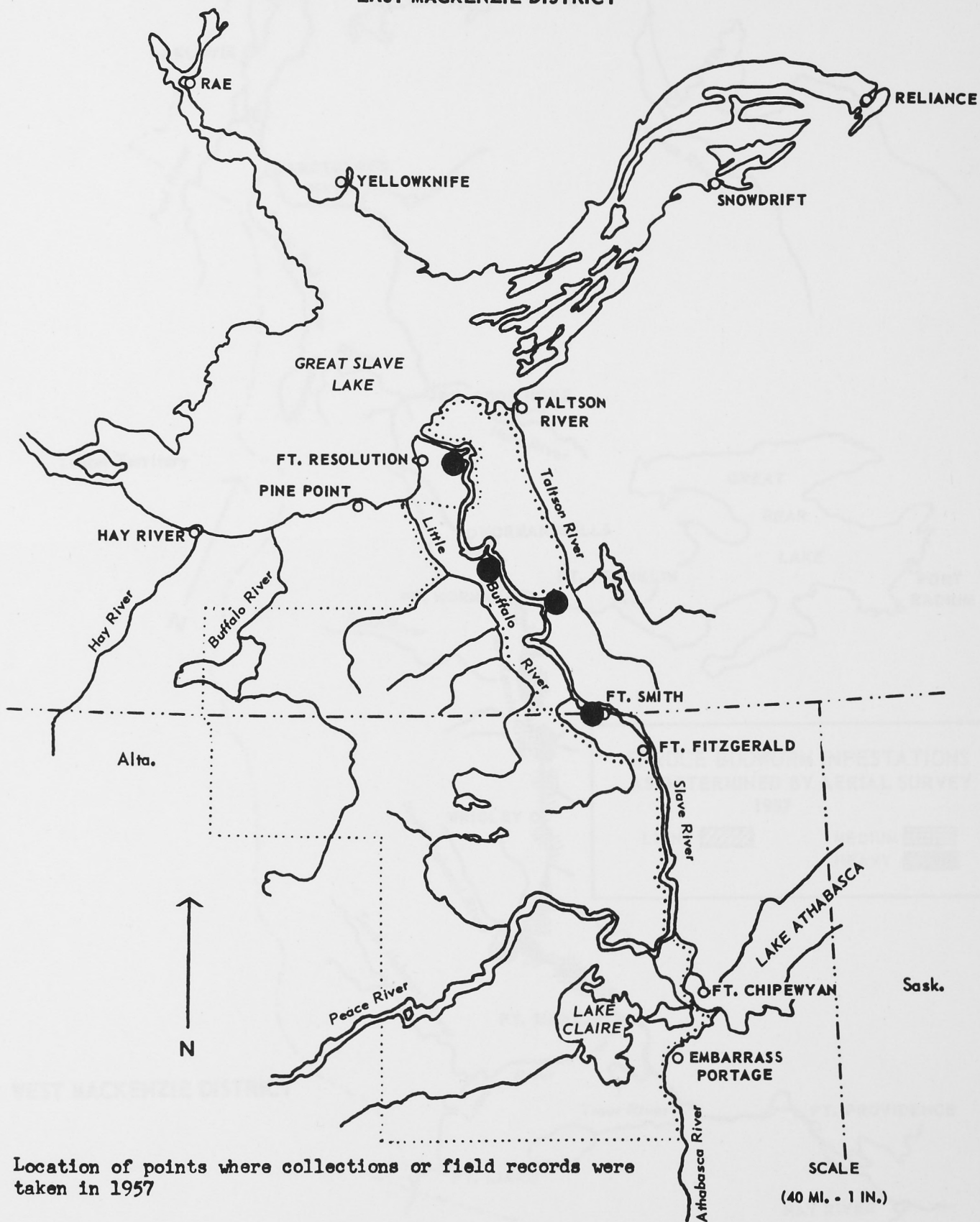
of Norman Wells. Large patches of infested spruce occurred on the North Nahanni River from its mouth to the vicinity of Mount Camsell. The details of location and intensities of infestation are shown on the accompanying map.

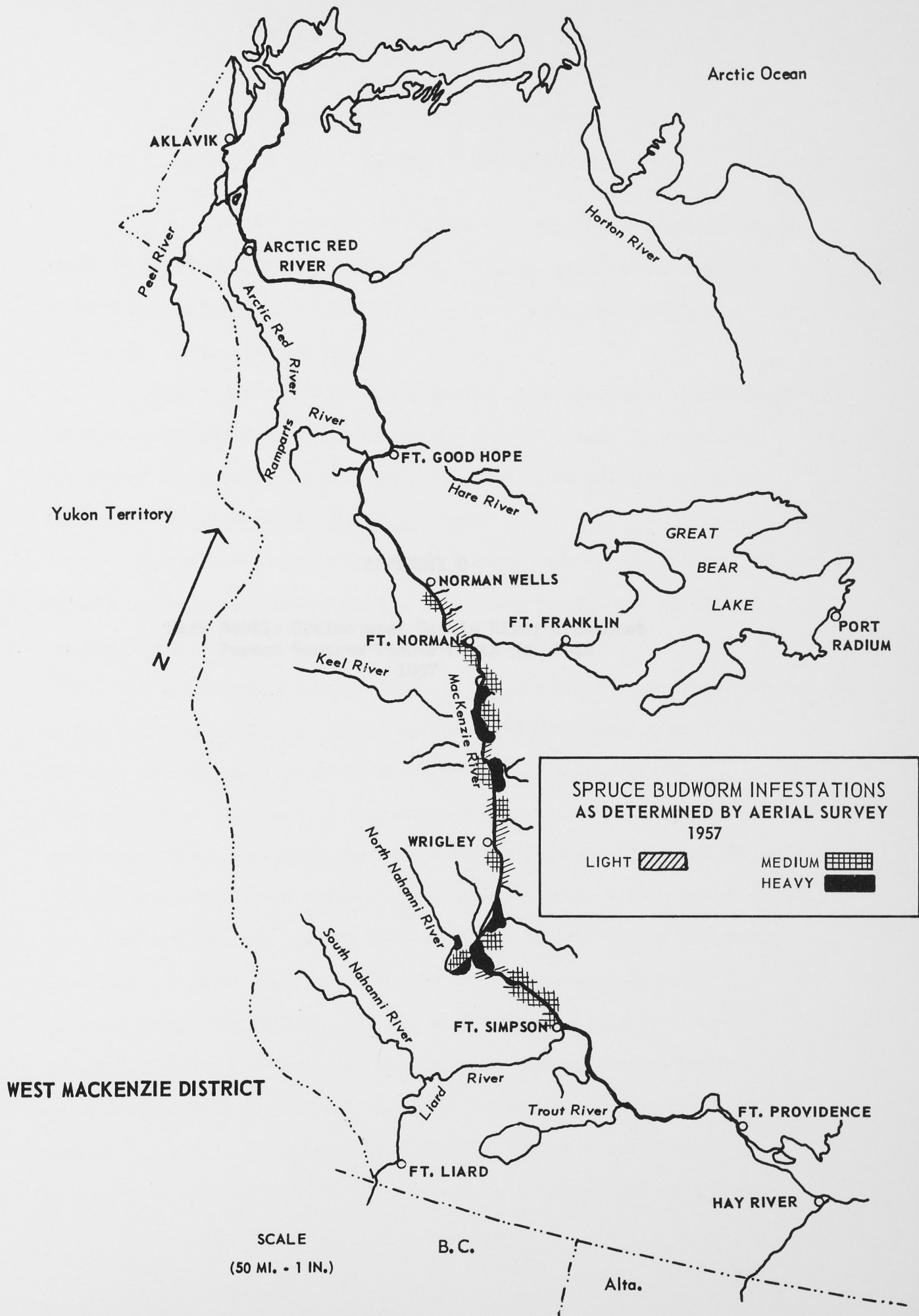
A landing was made below Old Fort Point and a stand of heavily attacked white spruce on an un-named island was examined. It was found that feeding of the spruce budworm had been completed and practically all of them had pupated. No moths could be found so that few if any eggs had been laid. Parasite pupae were common but there were enough healthy budworm pupae to produce moths in large numbers later in July.

At the time of this examination there was no indication that the outbreak was subsiding. There does not seem to be any immediate danger of tree mortality although there will probably be some top killing. This conclusion is based on the observation that most severely attacked trees had only the current years needles and a few of the second years needles eaten. Some of the tops, however, had been completely defoliated and will become stag-tops within the next year or so.



EAST MACKENZIE DISTRICT





BARK BEETLE CRUISE WEST CASTLE RIVER

CROWNEST FOREST RESERVE TIMBER BERTH NO. 1546

Late in the fall of 1957 members of the Forest Biology Ranger Staff of the Forest Biology Laboratory, Calgary, conducted a cruise of bark beetle infested or killed timber in a berth operated by Alberta Box Works, Lethbridge.

The majority of the stand consisted of Engelmann spruce about 250 years old; ranging from seven to thirty nine inches in diameter. The insect responsible for the damage in this stand was the Engelmann spruce beetle *Pityogenes caryophilus* Hopk.

APPENDIX C

Bark Beetle Cruise West Castle River Crowsnest
Forest Reserve Timber Berth No. 1546
1957

The survey was originally set up as a 2 per cent cruise but due to two heavy snow falls could not be completed and ended up as a 3.5 per cent cruise, covering 11.96 acres of the 1,220 acre limit. Parallel cruise lines were set up every $\frac{1}{2}$ mile at right angles to a north-south base line which ran approximately down the centre of the valley. Cruise lines were $\frac{1}{3}$ of a mile wide. All the trees in the cruise lines were examined for bark beetles and the DM of infested trees was taken. Unhealthy and dead trees were examined for amillaria root rot. Infested trees were divided into old kill, newly killed, or freshly attacked. It was difficult to determine the year of death without a great deal of work so that separation of trees into classes depended upon the judgment of the cruiser. "Old kill" were trees considered to have been dead for more than three years. Newly killed were trees

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The majority of the stand consisted of Engelmann spruce about 250 years old; ranging from seven to thirty nine inches in diameter. The insect responsible for the damage in this stand was the Engelmann spruce beetle Dendroctonus engelmanni Hopk.

A timber cruise made by the Alberta Department of Lands and Forests was used as a basis for the bark beetle cruise and no attempt was made to determine the volume of timber in the berth.

The survey was originally set up as a 2 per cent cruise but due to two heavy snow falls could not be completed and ended up as a 9.8 per cent cruise, covering 11.96 acres of the 1,220 acre limit. Parallel cruise lines were set up every $\frac{1}{4}$ mile at right angles to a north-south base line which ran approximately down the centre of the valley. Cruise lines were $\frac{1}{3}$ of a chain wide. All the trees in the cruise lines were examined for bark beetles and the DBH of infested trees was taken. Unhealthy and dead trees were examined for armillaria root rot. Infested trees were divided into old kill, newly killed, or freshly attacked. It was difficult to determine the year of death without a great deal of work so that separation of trees into classes depended upon the judgement of the cruiser. "Old kill" were trees considered to have been dead for more than three years. Newly killed were trees

which had been killed within the last three years and freshly attacked trees were those which had been attacked but were not yet dead.

The total volume and volumes per acre of the timber on the berth were obtained from the original cruise made by the Department of Lands and Forests. Volume tables prepared by the Dominion Forest Service were used to determine the volume of timber in the trees killed by the bark beetles.

Armillaria root rot, Armillaria mellea (Vahl ex Fries) Qué1., was present throughout the stand but according to Dr. D. Etheridge of the Forest Biology Laboratory was not progressing fast enough to cause serious deterioration in the stand before logging would be completed. This root rot undoubtedly contributed to the bark beetle damage in the stand.

The volume of timber killed or attacked and expected to die on the cruise lines was 82,098 FBM or 6,864.3 FBM per acre. From this it was calculated that 8,374,446 FBM had been attacked or killed on the berth. This figure amounted to 23.1 per cent of the total volume on the berth. Of this 23.1 per cent, 3.5 per cent of the timber had been killed within the past three years.

Rough calculations using these two figures indicate that approximately 1 per cent of the volume of the timber on the berth is being lost each year through bark beetles.

From an examination of the map it can be seen that much of the damage has taken place at the south end of the berth; unfortunately cruise lines 6,7,8,9 and the west half of 10 and 11 could not be completed because of snow.

From the information obtained we have concluded:

1. Twenty three per cent of the volume has been lost through bark beetle and root rot; 3.5 per cent within the last three years.

2. The rate of loss was calculated at 1 per cent or better per year.
3. Losses will be reduced by early cutting of the southern end and the valley bottoms.
4. The age and composition of the stand favor bark beetle attack; the rate of loss could be greatly accelerated should weather conditions become more favorable for the beetles.


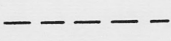
Forest Insect and Disease Survey,
Forest Biology Laboratory,
102 - 11th Avenue East,
Calgary, Alberta.

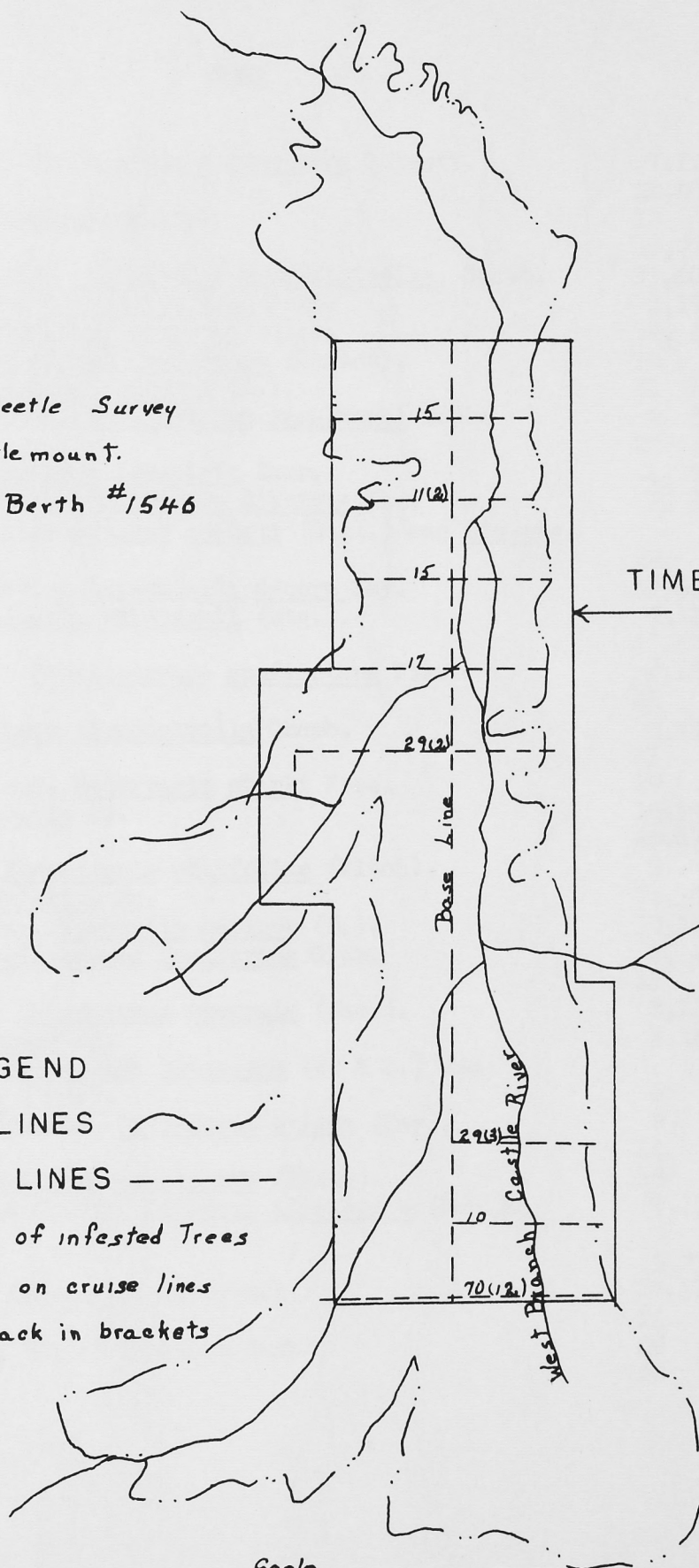
December 15, 1957.

Bark Beetle Survey
 Castlemount.
 Timber Berth #1546



TIMBER BERTH
 1546

LEGEND
 TYPE LINES 
 CRUISE LINES 
 Number of infested Trees
 indicated on cruise lines
 New attack in brackets



Scale

2 Mi. / in. Approx.

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